

Bibliotheca Herpetologica

A Journal of the History and Bibliography of Herpetology



VOL. 18

International Society for the History and Bibliography of Herpetology

THE SOCIETY

Mission. The ISHBH aims to promote research related to historical herpetology. The Society is devoted to stimulating and advancing the study of the history of the herpetological discipline and its bibliography. We bring together individuals for whom the history and bibliography of herpetology are appealing. We promote the knowledge of these and related topics among members and the general public. The Society was established in 1998. Membership is open to anyone who shares the aims of the Society.

Activities. The society members meet every year, usually in connection with other general herpetological meetings with international participation. Activities include visits to private and public libraries, museums and other places with historical links to the discipline. We organize workshops and sessions in the fields that form parts of larger national or international meetings on herpetology. Our shared lunches adjacent to the yearly business meetings have become popular among members and guests. The Society works to facilitate both formal and informal contacts among members.

Journal. The ISHBH publishes the journal *Bibliotheca Herpetologica*, which is the central pillar of the Society. It contains articles, essays, bibliographies and news of people and events in our field and is a peer-reviewed. The many important contributions make the publication a vital source for bibliographers, historians and taxonomists alike but at the same time the papers are by and large appealing to the layperson in the field.

Beginning with volume 14, ISHBH will adopt an open access publication model. Articles in *Bibliotheca Herpetologica* will be available online as soon as they receive final editorial approval. At the end of the year a hard copy version of *Bibliotheca Herpetologica*, containing all articles published that year, will be printed and distributed to current members.

The name of the journal, up to volume 5(1), was: *International Society for the History and Bibliography of Herpetology Newsletter and Bulletin*.

Membership. The membership fees cover the calendar year. ISHBH membership categories are: Corresponding Membership US\$25/year (open access only plus all other membership benefits), Regular Membership US\$50/year, Institutional Memberships US\$75/year, and Sponsoring US\$75/year. Regular, Institutional and Sponsoring members will receive a hard copy of each volume of *Bibliotheca Herpetologica*. Note that Life Members will retain their status. However, we are no longer offering new Life Memberships. To Join, go to our website <http://www.ishbh.com> and click on the Membership tab.

OFFICERS

Executive Committee Officers:

Chairperson: Aaron Bauer (USA)

Vice-Chairperson: Chris Bell (USA)

Treasurer: Eric Hilton (USA)

Secretary: John Murphy (USA)

Editor: Breck Bartholomew (USA)

Managing Editor & Webmaster: Ralph Tramontano (USA)

Member Without Portfolio: Luis Ceríaco (Portugal)

Other Officers:

Patron of the ISHBH: Ronald Javitch (Canada)

www.ishbh.com

All articles on pp. 1-107 copyrighted and version of record originally published online in 2024 (exact publication date at bottom of first page of each contribution). Hardcopy published December 2024.

FROM THE CHAIRMAN

This year the ISHBH was well represented at three major conferences. In June, we were a participating society, along with PARC (Partners in Amphibian and Reptile Conservation), at the annual meeting of the Society for the Study of Amphibians and Reptiles held at the University of Michigan in Ann Arbor. A highlight of our program at the meeting was a display of rare books held at the Research Museums Center on the campus of the University of Michigan. Approximately 50 books were selected from the collections of the Department of Herpetology at the Museum of Zoology and the University of Michigan Library. A catalogue of the display was prepared for attendees and is available to all members upon request. Although many well-known fine illustrated works were included, many of the titles selected for display were true rarities that even seasoned collectors may not have seen or handled before.

The ISHBH was also represented at the Joint Meeting of Ichthyologists and Herpetologists held in Pittsburgh, Pennsylvania in July. Although we did not have a formal program there, we were included as an affiliated society and the presentations included several talks with historical components.

Finally, in August we participated in the 10th World Congress of Herpetology held in Kuching, Malaysia and were hosted by long-time ISHBH member Prof. Indraneil Das. There we held a symposium entitled “Perspectives on the History of Herpetology” in which seven presentations spanning the 18th through 20th centuries investigated a diversity of historical topics. Our Society also co-published, with SSAR, a book that was distributed gratis to all meeting delegates: *Edward Bartlett (1844–1908) – Biography, Bibliography and Contributions to the Herpetology of Borneo*. In the best tradition of SSAR Facsimile Reprints in Herpetology, this book reproduces the hard-to-find original papers by Bartlett, the second curator of the Sarawak Museum, and adds an extensive biography and bibliography of this poorly known pioneer of Bornean zoology.

Our achievements as a Society are reflected in this issue of *Bibliotheca Herpetologica*, with its broad diversity of paper topics, in our growing series of longer contributions in *Wahlgreniana*, and in our well-attended symposium in Borneo. However, perhaps the most encouraging metric of our success could be seen at our annual business meeting and luncheon held in Ann Arbor. That event was attended by 15 members and three guests, and half of these participants were students. This follows a healthy trend in increased student participation that began to take off last year at our meeting in Norfolk, Virginia. For too long herpetological history has been perceived as a field of interest primarily for “senior” members of our community. However, appreciation for and interest in the history of our discipline is not age limited. For many it is a natural outcome of research that leads us back into the older literature in our discipline. For others it

may be precipitated by encounters with some of the many fascinating personages of the past who shared our passion for amphibians and reptiles. Others may be smitten by the exquisite hand-colored illustrations and fine craftsmanship of antiquarian books. Whatever your motivation for joining the ISHBH, we are happy to have you, and we hope that you will have a long and enjoyable association with the Society.

Aaron M. Bauer, Chairman
Villanova, Pennsylvania, USA

FROM THE EDITOR

Each year I look back through the articles published with a great appreciation to each of the authors for introducing me to such varied and interesting topics. I try to delve a bit deeper into each submission by checking some of the citations and looking for additional aspects that could be considered or explored. Often this leads me down a rabbit hole of herpetological history, which may or may not benefit the paper, but it gives me great satisfaction.

I hope that, as a reader, you gain some of the same satisfaction by being introduced to these topics. This particular volume is quite varied in coverage, containing three papers reconsidering older literature, adding clarification to past errors or omissions. An additional three papers discuss important contributions by women who have largely been overlooked in other histories. The remaining four papers discuss the origin and impact of Adriaen Coenen’s turtle illustrations in the 16th century; Herman Bumpus’ life and herpetological contributions; Frederik Alexander Lucas’ fictional book, *The Hermit Naturalist* (1899), which contains some surprisingly accurate information on snakes; and finally, a printing of the Reptile Merit Badge booklet led to an article discussing rationing during World War II with some herpetological links.

Each of these papers were originally published online and announced on the ISHBH website, where they remain available. Whether you read them when they were initially published, or if this print copy is your first introduction, please consider sharing them far and wide. ISHBH remains a small society, but our website allows us to have a large impact.

Our website stats indicate www.ishbh.com was visited more than 22,000 times in 2024, with our top paper viewed more than 500 times. It would be great if we could convert some of these viewers into members, or contributors. One way to do this is to make sure to keep the views coming—that requires both more papers on a wide variety of herpetological topics and more website content.

In addition to the journal and website, *Wahlgreniana* volume 3 was published: *State and Provincial Amphibian*

and Reptile Publications for the United States and Canada, Second Edition by John J. Moriarty and Aaron M. Bauer. This is a revised and expanded edition, including over 1300 citations to regional herpetological publications. Ordering information for all three volumes of *Wahlgreniana* is available at the end of this volume.

Bibliotheca Herpetologica volume 19, 2025 is looking like it will be off to a good start. Several papers have already been submitted. In addition, we have two submissions for the *Wahlgreniana* volumes. As always, please consider writing something for the journal, website, or *Wahlgreniana*.

Breck Bartholomew, Editor
Salt Lake City, Utah, USA

ABOUT THE COVER

The image gracing the cover of this volume of *Bibliotheca Herpetologica* depicts a female Rhinoceros Viper (*Vipera nasicornis*, now *Bitis nasicornis*) with one of its offspring, and comes from Catherine Cooper Hopley's (1882) book *Curiosities & Wonders of Serpent Life* (https://www.gutenberg.org/cache/epub/53153/pg53153-images.html#Page_320).

This book is considered to be the first popular English-language book ever to be published on the lives and habits of snakes. What is remarkable about this work is that it was authored by a woman in Victorian England—a period marked by sexism, misogyny, and defined societal gender roles where women were ineligible for post-secondary academic pursuits, and often excluded from participation in the natural sciences and memberships in scientific societies. Nevertheless, it was widely-acclaimed, receiving many positive and celebratory reviews, and its literary success flew in the face of numerous publishers that had declined or would not even entertain the idea of taking on the project because of its apparent “loathsome” subject matter.

Hopley acknowledges the artist of this fine work on p. 25: “In the choice of illustrations my aim has been rather to exemplify a few leading features than to attract by brilliantly-figured examples. Some of the woodcuts are borrowed from Günther's and Fayrer's works; others I have drawn faithfully from natural specimens; but in them all I am indebted to the kind and patient work of Mr. A. T. Elwes in reproducing my own imperfect attempts.”

To learn more about Catherine Hopley read Robert Mendyk's article “Early Zoo Studies in Herpetology: Catherine C. Hopley and the London Zoological Gardens” on p. 81.



*Het Schildpadboek: The Origins and Inspiration Behind the Turtle Watercolors of Adriaen Coenen's *Visboek* and *Walvisboek**

Matthew P. Bettelheim

5500 Pennsylvania Blvd, Concord, California 94521 USA. blackfish@nasw.org

INTRODUCTION

During the late European Renaissance period, the son of a Dutch fisherman in the Netherlands began a curious undertaking: a stunning series of detailed watercolor illustrations of fish, sea mammals, and other marine creatures of the North Sea and Atlantic Ocean. In the years that followed, he would eventually incorporate these folios into at least three illustrated manuscripts, of which only two have survived to this day. Although these watercolor folios were well received at the time, even if only by the limited audience they reached, they were otherwise left to gather dust until contemporary academics once again revisited these neglected works with new eyes.

Among the treasures waiting to be rediscovered in these watercolor illustrations were a handful of turtles. Some of these are bona fide turtles; others merely fanciful. What makes Coenen's work so special is that he was a "fisherman" first and foremost whose academic prowess was accidental, if not incidental, to the works he produced. Coenen's *Visboek* and *Walvisboek* were predominately products of his watchful eyes and steady hand, informed first by observation, and only secondhandedly by the scholarly texts of the time. Coenen's lack of bona fides does not diminish his work, but rather illuminates it's worth as modern scholars take a closer look at what this humble fisherman accomplished.

THE SON OF A FISHERMAN

The mastermind behind these venerated illustrations was Adriaen Coenen (Adriaen Coenzsz. van Schilperoort [1514–1587]). The son of a Dutch fisherman and a fisherman's daughter, Coenen was born, raised, and a life-long resident of the village of Scheveningen on the Dutch Coast of Holland, the Netherlands. Given his parentage, it seemed only natural that Coenen himself would become an apprentice, and eventually a clerk, at the Scheveningen fish market auction, as well as a wholesaler of dried and fresh fish. In later years, his expertise and involvement in the community brought him the prestige of becoming a respected village dignitary (Egmond and Mason 2003). In time, Coenen graduated

from an amateur to an official surveyor or "beachcomber"—taking in at all times the sea life around him and recording his observations in a notebook (Egmond and Mason 2003, Egmond 2018).

Little is known about Coenen's first manuscript, but by the 1560s the middle-aged amateur artist had completed enough watercolors to share them with the public in what would become his first *Visboek* (Fish Book). After gifting the unpublished manuscript to Prince William of Orange in 1574, the fate of this early work was lost to history. Emboldened by the positive reception he received after showing his work to the public, Coenen undertook the creation of a second manuscript between 1577 and 1579, another *Visboek* he referred to as his "Big Fish Book." This presumably larger endeavor included upon completion 412 folios (in this case, a double-sided page) featuring all sorts of fish, sea mammals, and other marine creatures (Egmond and Mason 2003).

In time, the finished *Visboek* found its way to lawyer Jacob Visser (1724–1804), and then the Koninklijke Nationale Bibliotheek (Royal National Library) in the Hague, Netherlands, in 1809. Because it had been handled so frequently over the years, pages had been torn, the binding was damaged, and the pages loose. Upon its arrival, the *Visboek* was stored in a climate-controlled warehouse due to its fragile condition. The visiting public was limited to perusing a facsimile of the manuscript presented either in binders of black and white photographs, or microfilm. When restoration began in 2002, specialists replaced the binding with 16th century materials that included wooden oak boards, flax fiber rope, and leather straps (Rings 2022). The manuscript was digitized during the restoration process, and currently resides in the Koninklijke Nationale Bibliotheek. Generally speaking, most mentions of Coenen's *Visboek* refer to this second, published volume. Full-page images of the pages featuring Coenen's turtle-specific watercolors and text from the *Visboek* can be seen in Figures 1–4.

Along the way, specialists learned that the watercolor drawings had each been illustrated within the pre-bound book, rather than illustrated separately and bound together upon the book's completion. Another revelation was that the "Big Fish Book" *Visboek*, Coenen's second manuscript, ap-



Fig. 1. Two facing pages from Adriaen Coenen's *Visboeck*. **Left:** Folio 191 (page 198 verso); **Right:** Folio 192 (page 199 recto) (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek).

pears to have been prepared by tracing drawings—presumably from his earlier 1574 *Visboeck* manuscript—as evidenced by the sign of a blunt object used to trace the outline of a mermaid watercolor drawing bound in the 1577–1579 volume, leaving cuts in the paper (Rings 2022).

Coenen's next manuscript, the 1584 *Walvisboeck* (Whale Book), consisted of 125 one-sided folios bound in two volumes, with 58 folios in Book 1, an intervening fold-out, and 66 folios in Book 2. The *Walvisboeck* appears to have taken full advantage of the 31 x 40 cm landscape layout of the folio pages (Egmond and Mason 2003). Rather than composing each illustration across opposing verso (the left-hand page of an open book) and recto (the right-hand page of an open book) leaves and contending with the gutter break splitting each image, the watercolors in *Walvisboeck* had ample room to sprawl across the page, a layout befitting their eponymous subject matter of fusiform whales and dolphins. The manuscript has since been digitized in 2011, and currently resides in the Erfgoedbibliotheek Hendrik Conscience (Hendrik Conscience Heritage Library) in Antwerp, Belgium. Images of the full pages featuring Coenen's turtle-specific watercolors and text from the *Walvis-*

boeck can be seen in Figures 5–6.

At the close of Book 2, Coenen's text suggests that he had intended to compile a third volume to the *Walvisboeck*. It could be that Coenen's last work, the unfinished 1585 *Haringkoningboeck* (Herring King Book) manuscript, was intended to be *Walvisboeck*'s missing Book 3 rather than a stand-alone manuscript. The *Haringkoningboeck* manuscript resides in the Historisches Archiv der Stadt Köln (Cologne Municipal Archive) (Egmond and Mason 2003). Although it has yet to be digitized, it was copied onto microfiche, and is available through the archive under the Accession No. 296: "Beschreibung von Walfischen, Rochen, Seehunden usw. - 16. Jh. (1585)" (Coenen 1585).

Despite what their names might imply, the *Walvisboeck* and *Visboeck* tackle a similar, if not overlapping, assemblage of whales, dolphins, and fish. The primary difference between the two works is the *Visboeck*'s breadth, which leaves fish, and at times the sea altogether, well behind in its extensive landward coverage of invertebrates, birds, amphibians, reptiles, mammals, people, and otherwise fantastical creatures.



Fig. 2. Two separate pages from Adriaen Coenen's *Visboeck*. **Left:** Folio 193 (page 200 verso); **Right:** Folio 191 (page 198 recto) (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek).

Characteristics common across all of Coenen's folios include watercolor illustrations of fish, marine mammals, and other marine life (including mythical creatures whose existence had not yet been dispelled); a reliance on ochre, green, red, pink, purple, brown, and black water-based paints; decorated margins; and framed textual passages, oftentimes composed of detailed text describing the annual passage and stranding of whales, fishing techniques and technology, and the response of fish and birds to meteorological conditions (Egmond and Mason 2003). Coenen's writing, scholars explain, can be described as a "racy and by no means academic Dutch, seasoned with quotations in Latin, French and German..." in a style that is "witty, lively, full of anecdotes, personal and by no means literary" (Egmond and Mason 2003). The *Visboeck* was, "like all of Coenen's manuscripts... a rambling collection bearing many resemblances to the 'cabinet of curiosities' that began to emerge in various parts of Europe at precisely this time" (Egmond and Mason 2003).

THE ORIGINS OF SPECIES

Because none of Coenen's manuscripts were published in the commercial sense, they were therefore known to very few people at that time. Instead, Coenen scholars suggest that the importance of Coenen's contributions to the field of natural history lies in their demonstration of "the forms of knowledge that were accessible to a man who did not belong to the elite of sixteenth-century Holland, and especially how he read and integrated knowledge drawn from his reading and his practical experience into a more or less orderly whole in a manner that is both highly personal and also typical of the sixteenth century" (Egmond and Mason 2003).

Such an observation begs the question, how did a simple fisherman have access to the numerous classical and medieval texts he so generously quoted from in Latin, French, and German? For one thing, much of Coenen's access to scholarly publications came through his associations with friend and patron Cornelis Suys, as well as other well-to-do acquaintances and finally, late in life (1580–1587), the University of Leiden (Egmond and Mason 2003, Egmond 2018). With little



Fig. 3. Two separate pages from Adriaen Coenen's *Visboeck*. **Left:** Folio 193 (page 200 recto); **Right:** Folio 297 (page 300 recto) (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek).

more than a basic education from the village school, Coenen was a self-taught collector and naturalist. As an adult, he carried with him a “memory book” to record observations and findings, a practice he began in childhood, and kept a “small writing room” in which it is believed he painted and housed his collections (Egmond 2018).

As was common at the time, printers regularly transposed and recycled images from others' illustrated works (Egmond and Mason 2003). Coenen was no different from other such copyists, although his exquisite watercolors and colorful commentary were exemplary for a non-academic of his time. While Coenen drew on his personal experience in the fish market and beachcombing to infuse his writing with firsthand observations and experiences (Egmond and Mason 2003, Egmond 2018), as well as interviewing eyewitnesses from the fishing and local communities for their firsthand accounts (Egmond 2018), he also liberally copied the texts and woodcut engravings from earlier sources on natural history (Egmond and Mason 2003).

Many of Coenen's turtle watercolors, for example, were among those illustrations he likely sampled from one of the many editions, translations, or reprintings of Conrad Gess-

ner's multi-volume *Historia Animalia* (1551–1558) (Egmond 2013). In particular, at least four of Coenen's *Visboeck* illustrations [Coenen's Folio 192 (page 199r), Folio 193 (page 200r), Folio 297 (page 300r), and Folio 397 (page 399r) and their subsequent duplicates in the *Walvisboeck*], in part or in full, can be attributed to woodcuts in Gessner's volumes in Latin on fish and aquatic animals (1558; Liber IV) (Gessner 1558) and/or reptiles and amphibians (published posthumously as a compilation of Gessner's materials in 1587; Liber V) (Gessner 1587), and their equivalent later German translations, *Thierbuch* (Gessner 1563a) [Coenen Folio 297 (page 300r)] and *Fischbuch* (Gessner 1563b) [Coenen Folio 397 (page 399r)]. However, earlier examples that predate Gessner can be traced back to French naturalists Pierre Belon (Belon 1553) [Coenen Folio 192 (page 199r) and Folio 193 (page 200r)] and Guillaume Rondelet (Rondelet 1554–1555) [Coenen Folio 397 (page 399r)].

All such works leaned heavily on the classic Greek and Latin natural histories by none other than Aristotle (384 BC–322 BC) and Pliny (the Elder) (AD 23 or 24–AD 79), to name a few. In comparing the work of Aristotle and Pliny with later natural histories, the derivative nature of these later works



Fig. 4. A single page from Adriaen Coenen's *Visboek*. Folio 397 (page 399 recto) (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek).

becomes apparent, although some copyists, such as Rondelet (Kitchell and Rhodin 1996), chose to update the classic works by including their own observations or advances in the burgeoning field of natural history.

In 2010, cultural historian Florike Egmond at the University of Leiden rediscovered two albums in the collection of Swiss naturalist Felix Platter containing hundreds of original watercolor drawings, many of which were meant as *Vorlagen* (models or preliminary sketches) upon which Gessner based his woodcut illustrations. While they reside at the Universiteit van Amsterdam (University Library of Amsterdam) presently, they first arrived there in 1878 on indefinite loan as part of a collection of printed and manuscript texts belonging to the Remonstrantse Gemeente, a branch of the Protestant Church in the Northern Netherlands, acquired sometime during the early nineteenth century (Egmond 2013).

Curiously, among all of these examples of reusing images are two prominent Rondelet images that were carried forward by Gessner and future copyists, but which Coenen neglected, for whatever reason, to illustrate in either *Visboek* or *Walvisboek*. The first, a Loggerhead Turtle (*Caretta caretta*), and the second, a Leatherback Turtle (*Dermochelys coriacea*)

(Fig. 7), are well documented (Kitchell and Rhodin 1996) and, notwithstanding Coenen, otherwise well represented in the literature. A third image Coenen neglected to include, that of an empty tortoise shell, appeared in Gessner (Gessner 1554; 1563a) based on a *Vorlage* in the Gessner-Platter Albums (Fig. 8). At quick glance, the shell's singular elongated gular scute suggests the shell belongs to the Angulate or South African Bowsprit Tortoise (*Chersina angulata*) of southern Africa. Coenen does quote Pliny in Folio 397 (399 r) who describes "Chersinas [turtles]... in the wilderness of Africa", as does Gessner (Gessner 1554), even if Coenen chose not to include this specimen in his *Visboek*.

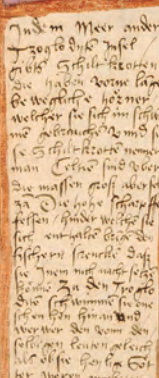
Notably, the empty *Chersinas* tortoise shell is only one of two turtle *Vorlagen* in the Gessner-Platter Albums; the second is that of a Loggerhead Turtle (Gessner 1516–1565) (Figs. 9 and 10), which is discussed below under Folio 297 (page 300r).

VISBOECK STATUS

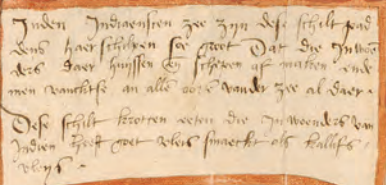
Notwithstanding the Dutch-language biography of Coenen by Florike Egmond in 1997 (Egmond 1997) and a handful of academic articles by Egmond and Peter Mason, the 2003 publication of *The Whale Book: Whales and other Marine Mammals as Described by Adriaen Coenen in 1585* marked the first attempt to showcase Coenen's work to a broader, non-academic audience. *The Whale Book* includes all of the illustrated pages of Book 1 of the *Walvisboek*, a handful of pages from Book 2, and seven folios from the *Visboek* (Egmond and Mason 2003).

In the pages that follow, Coenen's original turtle text is presented alongside a formal English translation (provided by Florike Egmond), together with the identity of each illustrated bona fide (and imaginary) turtle species, and commentary (as appropriate) on the original and quoted texts and illustrations. The English translations include both Coenen's native Dutch ([Du]), as well as quoted excerpts (indicated as indented passages) presented in their original French ([Fr]), German ([Ge]), and Spanish ([Sp]) with the original language so noted, as well as the source of the quoted passage. However, due to the multiple reprints and/or editions published for each of these volumes over the years, the page(s) where the quoted passages appear is not cited here.

Coenen's text is also paired with a detailed close-up of his original illustrated turtle watercolor together with the Gessner woodcuts that inspired Coenen and their antecedent *Vorlagen* (if available), both literally (the Gessner-Platter Albums) and figuratively (e.g., Gessner, Belon), in Figures 11–19. To provide the setting against which Coenen's watercolors first appeared, the full-page folios of the *Visboek* and *Walvisboek* are presented in Figures 1–4 and Figures 5–6, respectively. The antecedent illustrations featured here are a mere sampling, rather than an exhaustive inventory, of any such illustrations that may have preceded Coenen and his peers and predecessors. Other examples may exist that pre-

[illegible]

Van groote schilt pallens en groote starcken

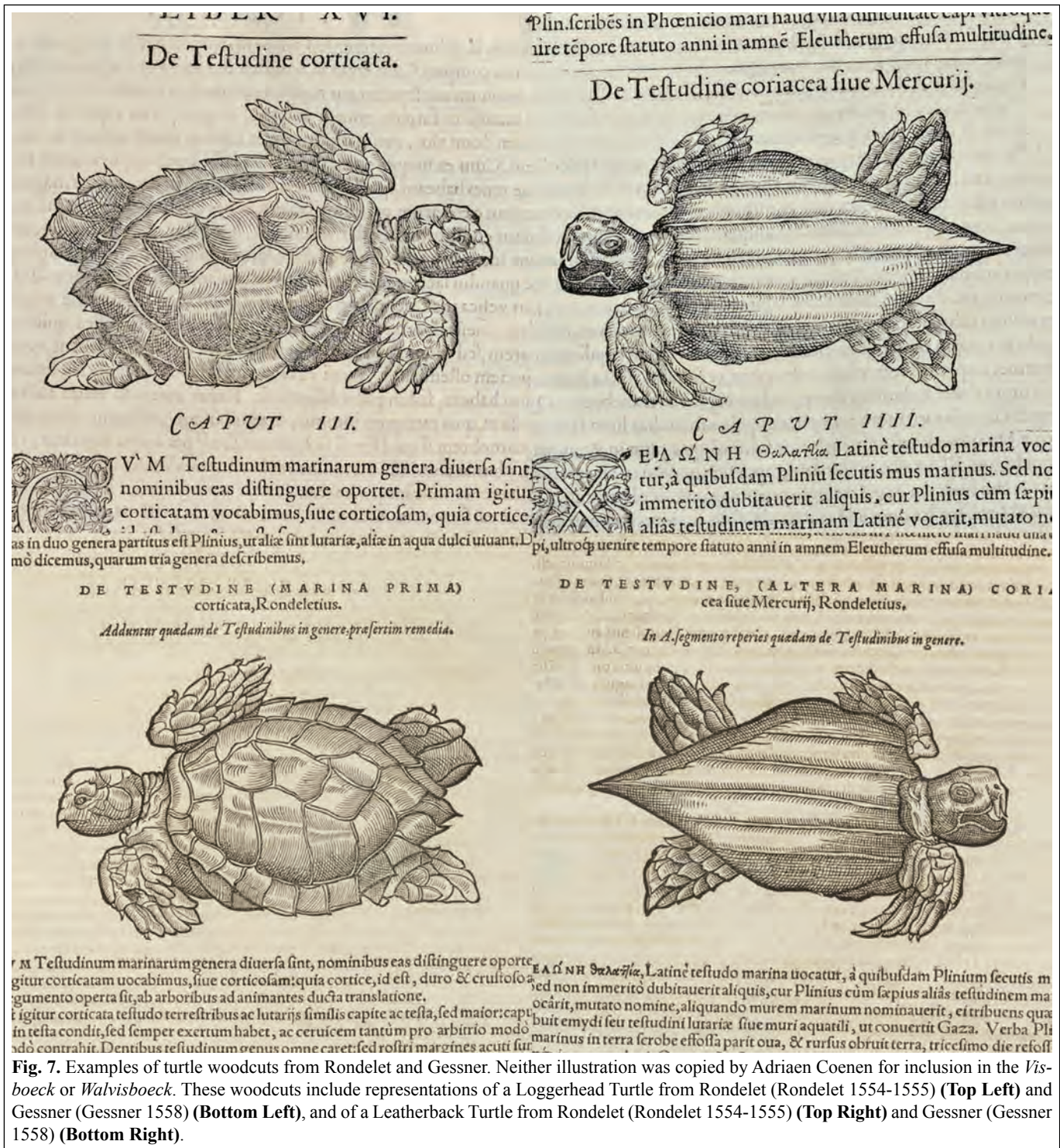


Tant es Gensnerus Alle mant devant sa mort
Vray que i en auois veu de tels a Lamer
noire ? que les Brez du pays nomment phelose
de tes Turcs Alez. Les Tartares Allez
de les Arabes Lual. Lachar en est fort de lants
de lants a manger : tel :

6



Fig. 6. Two separate pages from Adriaen Coenen's *Walvisboeck*. **Top:** Recto 26 (page 90); **Bottom:** Recto 27 (page 91) (Coenen 1584) (Courtesy of the Erfgoedbibliotheek Hendrik Conscience, Bruikleen Koninklijke Maatschappij voor Dierkunde Antwerpen).



date these illustrations, and many more no doubt illuminated future manuscripts in the years that followed.

The notes that accompany each folio provide background and historical context, and attempt at times to decipher some of the more cryptic historical passages. For example, a new explanation is offered herein to make sense of Pliny's ever-enigmatic passage describing the "wisp of straw" male turtles use to beguile females during courtship, and new light is cast

upon Pliny's reference to *bourbieres et fangeardes* that gave rise to the present-day French vernacular *la tortue bourbeuse*.

If Coenen's previous works celebrated the world's fish and whales, this homage to Coenen could be thought of as a celebratory *Schildpadboek*, or Turtle Book. Together, this collage of watercolor, ink, and written text pays colorful tribute to the turtles they embody in an effort to continue to share Coenen's work with a broader audience.



Fig. 8. Examples of a Chersina tortoise shell Vorlagen and the subsequent woodcuts from Gessner (1554) and Gessner (1583 edition or Gessner 1563). Neither the Vorlagen nor the woodcuts were copied by Adriaen Coenen for inclusion in the *Visboeck* or *Walvisboeck*. These include the Vorlage from the Gessner-Platter Albums (Gessner 1516–1565) (Courtesy of Allard Pierson, University of Amsterdam; Hs. III C 23, folio 86r) (Left) and the Gessner (Gessner 1554) (Middle) and Gessner (Gessner 1583 edition of Gessner 1563a) (Right) woodcuts.



Fig. 9. The Chersina tortoise shell watercolor drawing Vorlage from the Gessner-Platter Albums (Gessner 1516–1565) (Courtesy of Allard Pierson, University of Amsterdam; Hs. III C 23, folio 86r).



Fig. 10. The Loggerhead Turtle watercolor drawing Vorlage from the Gessner-Platter Albums (Gessner 1516–1565) (Courtesy of Allard Pierson, University of Amsterdam; Hs. III C 23, folio 88r).

Turtle Species: “Tortuca” (imaginary)**Source:** *Visboeck* (1577)**Folio (Page):** 191 (198 recto) [text and illustration]**Representative Illustrations:** Figure 11**Corresponding Book (Folio) in *Walvisboeck* (1584):** n/a**Text:****Original (Dutch)**

{Labels: Tortuca [Du] – Aldus gefijguert inden Dierenpallaijs [Du]}

TORTUCA is een monstere der zee bedect met een groote herde scelpe ende dat is sinen scilt Driecantich teghen dat gescut ende dit beeste is 8 cubitus lanck ende 4 cubitus breed maer den schilt is breder dan dat lijf want hi is 5 cubitus breed ende heeft groote stercke beenen ende groote claeuwen ende groote vingher dan een leeu heeft ende is seer sterc ende stout want het en vreest hem niet 3 mannen te bevechten Maer sijn macht is wech alset metten rugghe op die aerde leijt want om die breetheijt vanden schilde so en can dit beest niet weder opstaen. [Du; source: van Doesborch 1520]

English Translation{Labels: Tortuca – Illustrated in this way in the *Dierenpallaijs*}

TORTUCA is a sea monster covered by a large hard shell and that is its shield, triangular against gunfire. And this animal is 8 cubit long and 4 cubit wide, but its shell is wider than its body, 5 cubit wide, and it has large strong legs and big claws and large fingers, bigger than a lion, and it is very strong and audacious because it does not fear to fight even three men. But it loses its power when it lies on its back on the ground because the wideness of its shell prevents it from getting upright again.

Possible Source Material: Jacob Meydenbach’s 1491 *Ortus Sanitatis* [text/illustration] (Meydenbach 1491), Johann Strassbourg Prüss’ 1497 *Ortus Sanitatis* [text/illustration] (Prüss 1497), and Jan van Doesborch’s 1520 *Der Dieren Palley* [text/illustration] (van Doesborch 1520).

Notes: Given the descriptions provided, the “Tortuca” is presumed to be an imaginary sea monster. The name “tortuca” can be traced at least as far back as poet Jacob van Maerlant’s *Der naturen bloeme* (ca. 1270) in a passage that describes turtles (van Maerlant 1340–1350). The referenced source material (“Dierenpallaijs”) that inspired Coenen’s watercolour illustration of the “Tortuca” (and from which the text was copied) appears to be Jan van Doesborch’s 1520 *Der Dieren Palley* (The Palace of the Animals) (van Doesborch 1520) in Dutch, itself a translation of either Jacob Meydenbach’s 1491 *Ortus Sanitatis* (The Garden of Health) (Meydenbach 1491) or Johann Prüss’ 1497 *Ortus Sanitatis* (Prüss 1497).

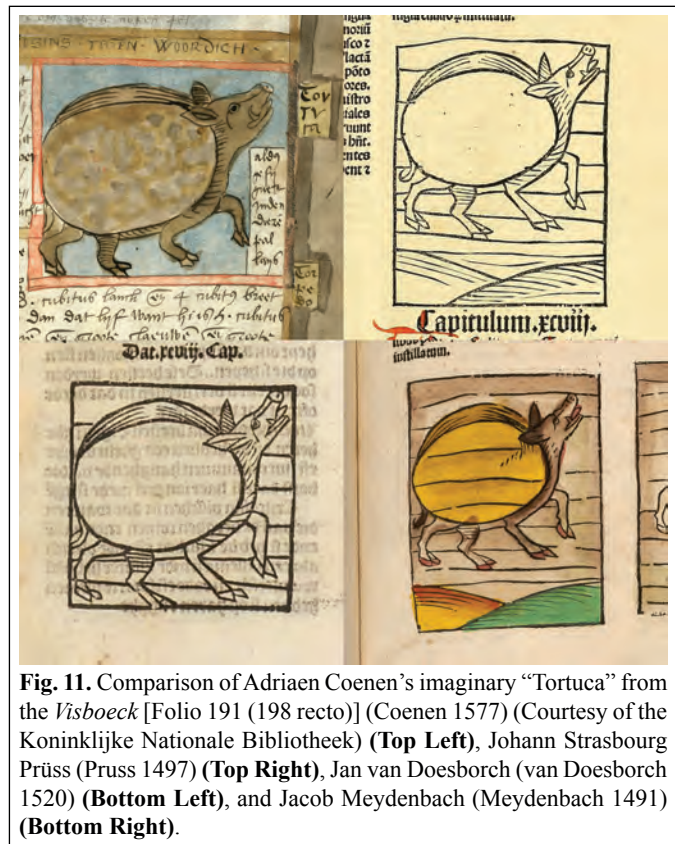


Fig. 11. Comparison of Adriaen Coenen’s imaginary “Tortuca” from the *Visboeck* [Folio 191 (198 recto)] (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek) (**Top Left**), Johann Strassbourg Prüss (Prüss 1497) (**Top Right**), Jan van Doesborch (van Doesborch 1520) (**Bottom Left**), and Jacob Meydenbach (Meydenbach 1491) (**Bottom Right**).



Fig. 12. Comparison of Adriaen Coenen's imaginary "Tortuka" from the *Visboeck* [Folio 191 (198 verso)] (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek) (**Left**), *Walvisboeck* Folio II (24 recto) (Coenen 1584) (Courtesy of the Erfgoedbibliotheek Hendrik Conscience, Bruikleen Koninklijke Maatschappij voor Dierkunde Antwerpen) (**Bottom Right**), and Johannes Heyden (Heyden 1565) (**Top Right**).

Turtle Species: "Tortuka" (imaginary)

Source: *Visboeck* (1577)

Folio (Page): 191 (198 verso) [text and illustration] and 192 (199 recto) [text]

Representative Illustrations: Figure 12

Corresponding Book (Folio) in *Walvisboeck* (1584): II (24 recto)

Text:

Original (Dutch, German, Spanish)

{Labels: Tortuka [Sp] – Schiltkrot [Ge] – Een groot scilt-padde [Du]}

Forer: beij Montpellier ward im Jaer 1520 eind Meer-schiltkrott gefangen welche dreij Menner auff ihr tragen und nichts dest weniger wandtlen konte. [Ge; source: Gessner 1563b]

Wie die Schilt krotten ghevanghen werden. [Ge]

Von den grossen meerschiltkrotten und wie die selbigen gefangen werden. [Ge]

English Translation

{Labels: Turtle – Turtle – A big turtle}

Forer: in 1520, near Montpellier, a very large sea turtle was caught, that had to be carried by three men, and nonetheless it was able to walk.

How turtles are caught.

About large sea turtles and how they are caught.

Schiltkrotte in our Dutch-German schildpadden.

The Indian Sea produces such unusually large turtles

Schiltkrotte ons Holllants Duits sciltpadde. [Ge/Du]

Das Indianische Meer wirfft solche unkümlische gross Schiltkrotten auss dasz man ausz ihrer Schalen einer ein gantze hutte dar unter zum wonen decken kan Ausz solchen Schalen machen auch die leut in den grentzen am Roten Meer kleine werdlinge und Schifffen darinn von einer Insel zu der andern wie in kleinen Nachen. [Ge; source: Heyden 1565]

Sie werden auff vil wege gefanghen und sonderlich der zeit wenn sie sich gegen der Mittags werme oben auff das Meer lassen unnd mit gantzen rucken bloß bey dem stille wasser daher laviren welcher lust, so freij unterm blauwen Himmel lufft oder athem zu schöpfen sie der massen betört unnd verleckert dasz sie ihrer selbs vergessen unnd da so lange ander Sonnen umbher schwimmen bisz ihnen die Schalen von der grossen Hitze dermassen austrucken dasz sie nicht regen noch sich da mit wider unter das Wasser sencken können sondern schwimmen also on ihren willen hin und her auff dem wasser und werden also leichtlich ereilt Ja auch mit handen gefangen. [Ge; ibid]

Man saget auch dasz sie beijder nacht aussem Meer auff die weiden ans Ufer kriechen unnd wenn sie sich da begirlich gefullet dasz ihnen der wanst schwer unnd faul wirt en schlaffen sie so bald sie wider am morgen ins wasser kommen unnd verrathen sich da selber mit ihrem harten Schnarchen dasz man sie man sie liederlich ohne ihr vorwisse begreifen kan. Daas gehet aber also zu: Es fahren irer dreij ausz den fischern gegen einer ieghlicher Schiltkrotten in eenen kleinem Schifflin hinzu und wenn sie nahe dar bey kommen so greiffen die zwey [...]

< next page >

[...] die Schiltkrot dorstigklich an unnd werffen sie auff den rücken der dritte aber legt ihr geschwinde ein starckes langes seil an halsz oden an einen füsz da sind denn vil leut am Ufer bestellet welche die Schiltkrot vollends mit grosser gewalt zum landen herauf ziehen. [Ge; ibid]

Auf dem Meer des landes Phenicia werden sie noch leichter gefangen denn sie kommen zum gewisser Jares friste mit grossen hauffen in den flusz Eleuther und werden daselbs one sondere arbeit verstrickt. [Ge; ibid]

Die Schiltkrotten haben keine zäne aber scharpffe harte kifel die so geheb auffeinander schliessen als die salben oder krautbüchsen. [Ge; ibid]

that these can be used to make a roof for a whole hut in which people can live. From such turtle shells the people living along the shores of the Red Sea also create small boats and ships in which they travel from one island to another, like small barges.

They are caught in many ways and particularly during the period of the afternoon heat when they go to the surface of the sea and float around on the calm water with their whole back exposed. The pleasure of breathing freely under the blue skies enchants and captivates them to such an extent that they forget themselves and continue floating in the sun for such a long time that their shells dry out by the enormous heat. Then they can neither change their position nor sink down under water, but they swim back and forth on the surface, and it is easy to overtake them and even catch them by hand.

It is said that turtles emerge from the sea by night and crawl up into the meadows near the sea shore, and once they have voraciously eaten their fill their bellies become heavy and lazy, and they fall asleep immediately once they reach the water in the morning and they betray themselves by their loud snoring so that they can be caught unawares without any effort. This goes as follows: three of the fishermen approach each turtle in a small boat, and when they are near enough two of them grab [...]

< next page >

[...] the turtle tightly and throw it on its back, while the third man quickly throws a long rope around its neck or one of its feet. A large number of people is called to come to the shore, who then drag the turtle with great force onto the land.

In the Phoenician sea they are even easier to catch, since they arrive every year at a fixed season in the river Eleutherus, and are caught there without any particular effort.

Turtles do not have teeth but sharp hard jaws that lock as closely together as a salve jar or a tin for herbs.

In the sea they also eat mussels. They have such strong and sharp jaws that they can also crunch whole stones. When they come on land, they graze the grass of the meadows.

They lay eggs just like birds' eggs, into the hundreds, which they lay on land not in the water and try to cover with a thin blanket of soil, and they hatch them by sitting on them, only by night.

Im Meer behelfen sie sich der Muschelfish haben so eind starckes hartes gebiss dass sie auh gantze stein damit zerknürschen. Wen sie auff das land herausz kommen fretzen sie dasz grasz auff der weide ab.”

[Ge; ibid]

Sie legen eijer gleich den vogel eijern ander zalett wan beij die hundert. Welche sie ausserhalb des wassers auffem lande mit erden fein digen zu decken unnd brütens mit ihrem ubersitzen nur beij nacht ausz. [Ge; ibid]

Ihre Jungen bringen sie bey Jares fristen aff. [Ge; ibid] Ettliche wöllen sie sollen ihre eijer mit blossen anstarren auszhecken das Weiblin vermischet sich nicht mit dem Männlin Es sei denn dasz ihme das gesicht verdeckt werde. [Ge; ibid]

Possible Source Material: Pliny's 1469 *Naturalis historia* [text] (Rackham 1938), Guillaume Rondelet's 1554–1555 *Libri de piscibus marinis* [text] (Rondelet 1554–1555), Conrad Gessner's 1558 *Historiae animalium* [text] (Gessner 1558), Conrad Gessner's 1563b *Thierbuch* [text] (Gessner 1563a), and Johannes Heyden's 1565 *Naturalis historia* [text/illustration] (Heyden 1565).

Notes: Coenen's "Tortuka" may represent a misspelling of the Spanish word for turtle, "Tortuca" or van Maerlant's "tortuca" (van Maerlant 1340–1350); whatever the reason, this distinction helps distinguish it from the previous "Tortuca" depicted in folio 191 (198 recto) for the sake of this discussion.

The leading quote Coenen attributes to Forer (see Gessner 1563b) first appeared in Rondelet (1554–1555; in French), Gessner (1563a; in German), and Heyden (1565; in German), and originally read in full (according to the English translation of Rondelet's French text):

The turtle which was captured in our sea in 1520 was so huge that it terrified children and inexperienced people. It had such strength that, led by ropes, it could drag along three people standing on its back and it could scarcely be dragged along by carts. The one who caught it exhibited it throughout neighboring towns in a traveling show to make some money. (Kitchell and Rhodin 1996)

Although Coenen's primary text on pages 191 (198 verso) and 192 (199 recto) appears to be unrelated to the accompanying "Tortuka" illustration, both the illustration and extended excerpt of German text (excluding the Forer quote) can at least be traced to Johannes Heyden's 1565 German translation of Gaius Plinius Secundus' (aka Pliny the Elder's) *Naturalis Historia* (Heyden 1565). Given that the English-translated text above may reflect the process of having undergone several translations (from Latin to German, and pres-

They lead their young away by the end of the year. Various people say that they hatch their eggs by simply staring at them; the female does not have intercourse with the male, unless its face is covered.

ently German to English), it is worth examining an earlier translation of Pliny's *Naturalis Historia*, from the original Latin to English, to return to and better understand the source material:

The Indian Ocean produces turtles¹ of such size that the natives roof dwelling-houses with the expanse of a single shell, and use them as boats in sailing, especially among the islands of the Red Sea. They are caught in a number of ways, but chiefly as they rise to the surface of the sea when the weather in the morning attracts them, and float across the calm waters with the whole of their backs projecting, and this pleasure of breathing freely cheats them into self-forgetfulness so much that their hide gets dried up by the heat and they are unable to dive, and go on floating against their will, an opportune prey for their hunters. They also say that turtles come ashore at night to graze and after gorging greedily grow languid and when they have gone back in the morning doze off to sleep on the surface of the water; that this is disclosed by the noise of their snoring; and that then the natives swim quietly up to them, three men to one turtle, and two turn it over on its back while the third throws a noose over it as it lies, and so it is dragged ashore by more men hauling from the beach. Turtles are caught without any difficulty in the Phoenician Sea; and at a regular period of the year they come of their own accord into the river Eleutherus in a straggling multitude.

The turtle has no teeth, but the edges of the beak are sharp on the upper side, and the mouth closing the lower jaw like a box is so hard that they can crush stones. They live on shell-fish in the sea and on plants when they come ashore. They bear eggs like birds' eggs numbering up to 100 at a time; these they bury in

¹ *Testudo marginata*, the land-tortoise. (Rackham 1938)

the ground somewhere ashore, cover them with earth rammed down and levelled with their chests, and sleep on them at night. They hatch the young in the space of a year. Some people think that they cherish their eggs by gazing at them with their eyes; and that the females refuse to couple till the male places a wisp of straw on one as she turns away from him.

Rackham's rough footnote-identification (which belongs to the English translation, *not* Pliny's original Latin text) of the turtle Pliny describes is most certainly incorrect, given that the Marginated Tortoise (*Testudo marginata*) is terrestrial, and the turtles Pliny describes are unquestionably sea turtles.

Mancini et al. (2015) notes that turtle shells were historically used to build roofs by members of local tribes in coastal communities of the Red Sea. This may be an indirect reference to Greek historian Agatharchides of Cnidus' description of a tribe of "Turtle-eaters (*Chelenophagi*)" in the Erythraean Sea (generally, the Red Sea area) who "shelter themselves with the shells of these animals which are large, so that they also sail in them" (Burstein 1989). More specifically,

The natives use their shells to make their houses, setting them up on high ground with the backs facing upwards like huts. They also employ them to sail across the straits and as vessels to hold water so that the same beast serves as boat, house, container, and food for the aforementioned people... The shells, which are bowl shaped, they use to sail across to the mainland, which they do to fetch water, and for shelter, placing them upright in the highest spots, so that nature seems to have granted them with one gift the satisfaction of many needs, for one and the same gift is their food, container, house and boat. (Burstein 1989)

A more contemporary instance is mentioned by British-American author and journalist Simon Winchester, who notes in *Outposts* (first published in 1985) that islanders from Saint Helena in the South Atlantic Ocean still remember the landing of an 800-lb "local turtle" (presumably, a sea turtle rather than the "tortoises" described elsewhere in the text) whose meat provided sustenance for two regiments of soldiers, and whose shell was used by a soldier to construct a roof for his family's house (Winchester 2009).

Some of Pliny's observations can in turn be sourced back to Aristotle. For example, Aristotle wrote in *Historia animalium*:

The sea-turtle lays on the ground eggs just like the eggs of domesticated birds, buries the eggs in the ground, and broods over them in the night-time. It lays a very great number of eggs, amounting at times to one hundred. (Thompson 1910)

...and:

The sea-turtles feed on shell-fish—for, by the way, their mouths are extraordinarily hard; whatever object it seizes, stone or other, it crunches into bits, but when it leaves the water for dry land it browses on grass. These creatures suffer greatly, and oftentimes die when they lie on the surface of the water exposed to a scorching sun; for, when once they have risen to the surface, they find a difficulty in sinking again. (Thompson 1910)

Pliny's passage describing a "wisp of straw" is puzzling. Pliny writes,

Quidam oculis spectandoque ova foveri ab iis putant, feminas coitum fugere donec mas festucam aliquam inponat aversae.

Some people think that they cherish their eggs by gazing at them with their eyes; and that the females refuse to couple till the male places a wisp of straw on one as she turns away from him. (Rackham 1938)

The word at the heart of this controversy is *festucum*, or "straw". Writing in 1918, British classicist Robert George Nisbet explored the idea that past interpretation of *festuca* to mean "straw" or "stalk of grass" belongs to "the plain man". The more learned scholar might know that in accordance with the Roman practice of manumission, or the emancipation of slaves, one form of granting freedom was the *manumission vindicta*, in which an owner appeared before an official of the province and laid a staff or rod, called either a *festuca* or *vindicta*, upon the slave's head and declared them free. Another idea Nisbet explores is Pliny's use of the phrase *herbam porrigo* in his natural histories and elsewhere, which could be interpreted metaphorically to mean "to hand over the grass" or to "[yield] possession of the field of combat". Grass, Nisbet explains, has often been construed by some as a sign of weakness or submission (Nisbet 1918), suggesting Pliny knew that any mention of straw could be imbued with additional meaning. Alternatively, passages in the works of Roman playwright Plautus (c. 254–184 BC) such as *Miles Gloriosus* and *Curculio* employ the terms *festuca* and *vindicta* as phallic *double entendres* for both rods and phalluses (Husby 2017). Considering all of these ulterior definitions, an alternative reading might be to simply interpret the passage as a turn of phrase to mean, "...the female refuses to couple until the male 'grants her freedom'..." or, in other words, yields to his advances or his "staff".

Topsell (1658) offers yet another explanation he attributes to the Greek poet Theocritus (300 BC–260BC), noting:

Theocritus writeth of a certain herb, that the male Tortoise getteth into his mouth, and at the time of lust tur-

neth the same to his female, who presently upon the smell thereof, is more enraged for copulation then is the male, and so giveth up her self to his pleasure without all fear of evil, or providence agaist future danger : but this herb neither he nor any other can name. (Topsell 1658)

Theocritus' mention of such an herb, however, is more general in nature, and not in any way specific to tortoises as might be implied from Topsell's text. In the poem *Idyll II* (or, "The Spell"), the poem's speaker, Simaetha, only makes mention of a "horse-madness" herb that grows in Arcady that makes "every filly, every flying mare run a-raving in the hills" (Page and Rouse 1912).

Such an herb is an example of what is known in Greek mythology as an "Iynx", a love charm, but also the "aphrodisiac cry or scent of mating animals" (Segal 1973), which is exemplified in a passage by Roman author Aelian (Claudius Aelianus) (c. 175 AD –c. 235 AD) who—in the footsteps of Pliny—writes in *De Natura Animalium* (On the Nature of Animals):

19. The land-Tortoise is a most lustful creature, at least the male is; the female however mates unwillingly. And Demostratus... admits that he does not know precisely whether there is any other reason for the female declining to copulate, but he claims to vouch for the following fact. The female couples only when looking toward the male, and when he has satisfied his desire he goes away, while the female is quite unable to turn over again owing to the bulk of her shell and because she has been pressed into the ground. And so she is abandoned by her mate to provide a meal for other animals and especially for eagles. This then, according to Demostratus, is what the females dread, and since their desires are moderate and they prefer life to pleasurable indulgence, the males are unable to coax them to the act. And so by some mysterious instinct the males cast an amorous spell ' that brings forgetfulness of all ' fear. It seems that the spells of a Tortoise in loving mood are by no means songs, like the trifles which Theocritus, the composer of sportive pastoral poems, wrote, but a mysterious herb of which Demostratus admits that neither he nor anyone else knows the name. Apparently the males adorn themselves with this herb, and some mysterious... At any rate if they hold this herb in their mouth there ensues the exact opposite to what I have described: the male becomes coy, but the female hitherto reluctant is now full of ardour and pursues him in a frenzied desire to mate; fear is banished and the females are not in the least afraid for their own safety. (Aelian 1959)

Of the two explanations, the wordplay of Pliny seems a more practical explanation than an herbal tortoise love charm.

The inspiration for Coenen's "Tortuka" illustration can be traced at least as far back as Johannes Heyden's *Naturalis historia* (1565), the German translation of Pliny (1469). In Heyden, the creature is labeled as both a "Testudo" and a "Schiltkrot" (Heyden 1565), leaving the basis for Coenen's naming convention up for question.

Assuming Heyden's illustration *was* meant to depict one of the turtles described in Pliny's work, it is worth considering whether there are enough clues in Pliny's text (or the Rondelet quote) to ascertain a possible identity of this fanciful chimeric turtle. Rondelet (1554–1555), whom Heyden cites early on, includes an oblique description of the turtle captured "in our sea" that has been interpreted by Kitchell and Rhodin (1996) to be a reference to Rondelet's birthplace, Montpellier, France, which border the Mediterranean Sea. Likewise, although Pliny's geography begins with the Indian Ocean, it then narrows in scope with mentions of the Phoenician Sea, which presumably refers to the Mediterranean Sea, the river Eleutherus, which is the present-day river Nahr al-Kabir that flows through Syria and Lebanon into the Mediterranean Sea, and the Red Sea. There are five sea turtles commonly found in the Red Sea [Green Turtle (*Chelonia mydas*), Hawksbill Turtle (*Eretmochelys imbricata*), Loggerhead Turtle (*Caretta caretta*), Olive Ridley Turtle (*Lepidochelys olivacea*), Leatherback Turtle (*Dermochelys coriacea*)] (Mancini et al. 2015). Of these, only two turtles are common Mediterranean Sea residents (Loggerhead Turtle and Leatherback Turtle) and the third, Green Turtle, a frequent Mediterranean Sea visitor (Ernst and Barbour 1989). The diets of all five species include a varying combination of algae and seaweed ("plants"), crustaceans, and mollusks ("shellfish") (Ernst and Barbour 1989). Based on size alone, Burststein (1989) reasonably conjectured that only the Leatherback Turtle could have attained a size large enough to produce a carapace suitable for repurposing as a roof or sailing vessel. Even if it were the case that Leatherback Turtle carapaces had once been used as building material, there is a confounding scarcity of archaeological or paleontological records of this species (Frazier et al. 2018), much less marine turtles in general (Çakırlar et al. 2021), which makes documentation of this practice difficult.

Rondelet (1554–1555) included two other illustrations to compliment his translation of Pliny's text: those of the Leatherback Turtle and the Loggerhead Turtle (Fig. 7). Without evidence to the contrary, it stands to reason that Heyden's fantastical "Testudo" or "Schiltkrot" was just that: another fanciful illustration he dreamed up bound only by the limits of one's imagination.

Turtle Species: Hawksbill Turtle (*Eretmochelys imbricata*)**Source:** *Visboeck* (1577)**Folio (Page):** 192 (199 recto) [*text and illustration*]**Representative Illustrations:** Figure 13**Corresponding Book (Folio) in Walvisboeck (1584):** II (26 recto)**Text:****Original (Dutch, French)**{Labels: Le dessus de la tortue de mer [Fr] – Op de rug [Du]
– Een groote schiltpadde op den rugge te sien [Du]}

Les Tortues. Combien que la tortue semble tenir de la nature et espece de ouistres ou poissons couverts de coquilles: toutesfois parce qu'elle approche de la facon du lizart et petit crocodile et aussi qu'elle fait des oeufs, et est de double vie, ce lieu nous a semble convenable pour en parler. [Fr; source: Belon 1555]

Or est il que la tortue hante la mer et les fleuves et neantmoins ne laisse a prendre sa pasture dessus la terre, parquoy Oppian la mise entre les bestes qui se retirent loing de lar mer. Et Pline a voulu dire que c'estoit une espece de rat d'eau. Quoy que soit, il y en a de deux sortes, les unes plus longues, et les autres plus rondes: les longues nagent plus avant en la mer et ne leur veoit on par dehors que la teste, la quelle parfois elles tiennent longuement hors l'eau, ainsi que les veaux marins, pour reprendre leur haleine. [Fr; *ibid*]

Lon en trouve grande quantite en la Mer Rouge et ont l'escaille si grande que quelque fois elle surpasse un grand huys; ainsi que j'ai veu en la ville de Torra, qui est un port dicelle Mer Rouge. Elles ont la teste si dure et la bouche si fermes, qu'elles rongent tout ce qu'elles trouvent, quelque dur qu'il soit. Leur chair est de fort bon manger, autant que des terrestres: mais les Grecs nij les Turcs n'en osent user par leur loij. Et y a ceste difference entre le masle et la femelle que le masle ha le dessous de l'escaille fort plat, et la femelle l'ha creux. Au demourant quand elles sont mortes elles flottent sur l'eau le ventre dessus. [Fr; *ibid*]

Possible Source Material: Pierre Belon's 1553 *Petri Belonii Cenomani De aquatilibus* [illustration] (Belon 1553), Pierre Belon's 1555 *La nature et diversité des poisons* [text/illustration] (Belon 1555), and Conrad Gessner's 1587 *Historiae animalium*, Liber 5 [illustration] (Gessner 1587).

Notes: In the original source material, Belon (1553) featured a dorsal and ventral view of a sea turtle. These two separate illustrations were later paired (in a manner of speaking) through collage by Gessner (1558) and then illustrated separately on individual folios by Coenen (Coenen 1577), including this dorsal view [page 192 (199 recto)] and the sub-

English Translation

{Labels: The uppderside of the sea turtle – The back of a turtle – Dorsal view of a large turtle}

Turtles. Although the turtle seems to belong by its nature and species among the oysters or the fishes that are covered by shells, it is nonetheless close in appearance to the lizard and the crocodile and it also lays eggs; it has a double life, and this seemed to me the right place to talk about it.

Turtle live in the seas and the rivers but they nonetheless also graze and find their food on land, and this is why Oppian put them among the animals that withdraw far from the sea. And Pliny chose to say that it was a kind of water rat. However this may be, there are two kinds: the one longer, the other rounder. The longer ones swim more horizontally in the sea and from above one sees only the head which they sometimes hold for a long time above the surface, like sea calves, in order to breathe.

Many of them can be found in the Red Sea and they have such a large shell that it is sometimes bigger than a large house, as I have seen in the town of Tora, a port on that same Red Sea. They have such a hard head and such strong mouths that they crunch everything they find, however hard it is. Their meat is very good to eat, just like that of the turtles that live on land, but the Greeks and the Turks do not dare to eat it because of their laws. And this is the difference between male and female: the bottom shell of the male is very flat, while that of the female is hollow. Once they are dead, they float on the water, belly up.

sequent ventral view [page 193 (200 recto)] that followed. Although no formal identification is provided or implied in Belon's text, the Belon image (Belon 1553, Belon 1555) and Coenen's illustrations only resemble a limited number of turtles. Allowing for artistic license and margin of error in the accurate reproduction of the number and placement of vertebral, pleural, and marginal scutes, two key morphological features stand out: the subject's pronounced marginal serrations and its elongated, beak-like snout. While the posterior serrations could indicate any number of turtles (Hawksbill Turtle, Loggerhead Turtle, Kemp's Ridley Turtle, Olive Rid-

ley Turtle), only the Hawksbill Turtle boasts the pronounced, beak-like bill.

Coenen's quoted French text is taken without attribution from Belon's 1555 French edition. In following with Belon's 1555 French edition (Belon 1555), Coenen's transcription uses the Dutch word for house ("huys") rather than the expected French ("maison"). It is uncertain whether this intentional word-swap by Belon signals something more significant, such as if the Dutch "huys" was better suited to express the idea of a shell as a home (a living space) rather than a house (the physical structure). Belon's earlier 1553 Latin edition says only, "Oblongas testudines omniū maximas in portu Torrae rubri maris ciuitatis frequentes vidimus, quarū testae, uanni bene magni longitudinem ac latitudinem exaequant" (roughly translated, "We saw in the harbor of the city of the Red Sea numerous long turtles, the largest of all, whose shells were very large in length and breadth") (Belon 1553), which suggests Belon amended the text in later editions/translations to include this simile ("bigger than a large house") to further expound upon the size of the turtles and their shells.

Belon's reference to "la ville de Torra" is a likely reference to the present-day city of El Tor, Egypt, situated along the Gulf of Suez off the Red Sea.

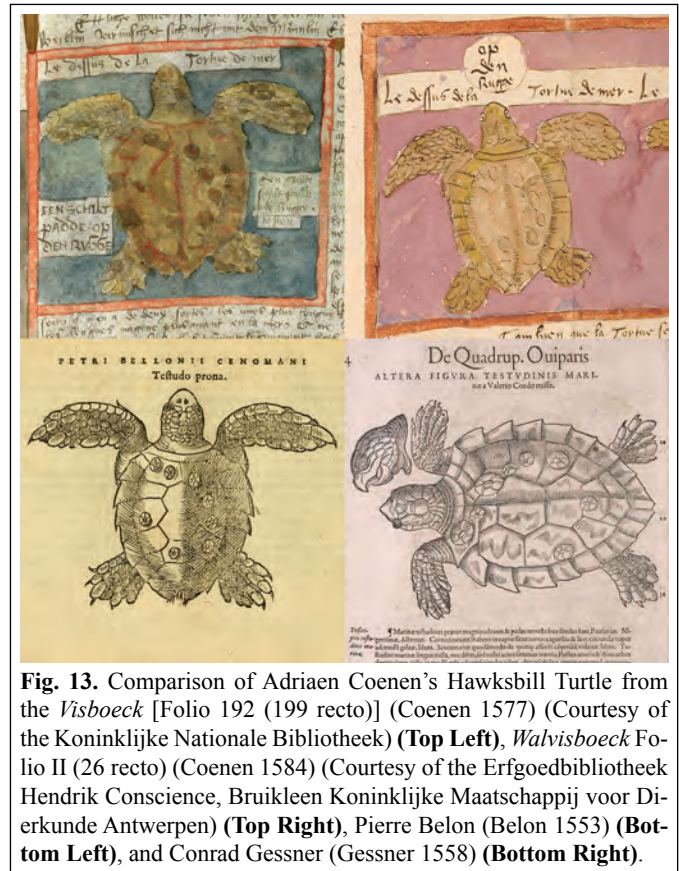


Fig. 13. Comparison of Adriaen Coenen's Hawksbill Turtle from the *Visboeck* [Folio 192 (199 recto)] (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek) (**Top Left**), *Walvisboeck* Folio II (26 recto) (Coenen 1584) (Courtesy of the Erfgoedbibliotheek Hendrik Conscience, Bruikleen Koninklijke Maatschappij voor Dierkunde Antwerpen) (**Top Right**), Pierre Belon (Belon 1553) (**Bottom Left**), and Conrad Gessner (Gessner 1558) (**Bottom Right**).

Turtle Species: Hawksbill Turtle (*Eretmochelys imbricata*)

Source: *Visboeck* (1577)

Folio (Page): 193 (200 recto) [text and illustration]

Representative Illustrations: Figure 14

Corresponding Book (Folio) in *Walvisboeck* (1584): II (26 recto)

Text:

Original (Dutch, German, French)

{Labels: Le Dessoubs de la Tortue de mer [Fr] – Hoechduits een Schiltkrot [Ge] – Ons Hollants Duits een groote scilt-padde [Du] – Die sciltpadde op den buiczij te sien [Du]}

Quant aux tortues des fleuves que Pline appelle bourbieres et fangeardes, elles ressemblent a celles de la mer, sauf qu'elles n'ont les escailles si grande; et ont les mesmes differences de longues et rondes toutesfois que toutes n'habitent pas au bourbier, car les longues (ainsi que dict a este des marines) nagent iusques au milieu des rivières. [Fr; source: Belon 1555]

Daer zijn menigher der beesten die groote scelpen hebben. [Du]

English (translation)

{Labels: The underside of the sea turtle – In High German Schiltkrot – In our Dutch German a large schildpad – The turtle seen on the side of the belly}

As regards the river turtles that Pliny calls bourbieres and fangeardes, they resemble the sea turtles, except that they have smaller shells. And they have the same difference between round and long ones. However, not all of them live in marshes, because the long ones (as has been said of the marine ones) swim up to the middle of rivers.

There are many animals that have big shells.

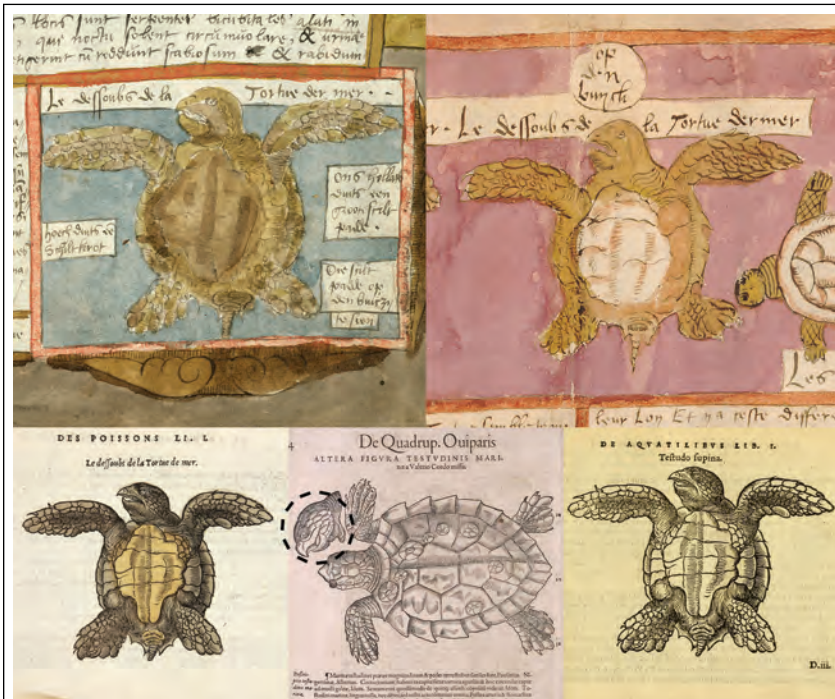


Fig. 14. Comparison of Adriaen Coenen's Hawksbill Turtle from the *Visboeck* [Folio 193 (200 recto)] (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek) (**Top Left**), *Walvisboeck* Folio II (26 recto) (Coenen 1584) (Courtesy of the Erfgoedbibliotheek Hendrik Conscience, Bruikleen Koninklijke Maatschappij voor Dierkunde Antwerpen) (**Top Right**), Pierre Belon, handcolored (Belon 1553) (Courtesy of Yale University Library, Beinecke Rare Book and Manuscript Library) (**Bottom Left**), Conrad Gessner (Gessner 1558) (**Bottom Center**), and Pierre Belon (Belon 1553) (**Bottom Right**).

Possible Source Material: Pierre Belon's 1553 *Petri Belonii Cenomani De aquatilibus* [illustration] (Belon 1553), Pierre Belon's 1555 *La nature et diversité des poissons* [illustration] (Belon 1555), and Conrad Gessner's 1587 *Historiae animalium*, Liber 5 [illustration] (Gessner 1587).

Thus, the likely interpretation of Belon's "bourbieres" (French root: bourbe or bourbière; "mud") and "fangeardes" (French root: fange; "mud" or "marsh") is mud turtle or marsh turtle. The European Pond Turtle (*Emys orbicularis*) is still commonly called, to this day, "la tortue bourbeuse" in the common vernacular (P. David, personal communication; see also Cotgrave 1611), due in no small part to later natural histories that cite Belon as the source for this colorful common name (see Bonaparte 1832, Duméril 1855).

The text, which describes a freshwater turtle, and illustration, which depicts a sea turtle, clearly do not complement each other.

Turtle Species: "sea eagle" (*imaginary*)

Source: *Visboeck* (1577)

Folio (Page): 193 (200 verso)

Representative Illustrations: Figure 15

Corresponding Book (Folio) in Walvisboeck (1584): II (27 recto)

Text:

Original (Dutch, French)

{Labels: Van een groote schiltpadde dien wij bij ons noemde een zee arent [Du]}

Anno 1565 op den 18 Junius ende was smanendaech na beloke Pinxster heeft eenen man tot Scheveninghe gheenaemt Frans Jansz ende dit was een man die ghemeenlijck een hele somertijt garnoten was cruijende ende dese man voors greep op desen dach voorscreven daer hij was cruie garnoten, eenen

English Translation

{Labels: About a big turtle that we call sea eagle}

On 18 June 1565, the Monday after Whitsunday, a man in Scheveningen called Frans Jans – who usually spent the whole summer shrimping – grabbed this big tortoise when it came out of the sea and crawled onto the beach. It had a beak like an eagle and wing-like fins, and instead of having feet at the back it had flat fins that looked like feet, and a big shell

Notes: As noted above [see page 192 (199 recto)], this illustration [page 193 (200 recto)] depicts the ventral view as the second of a pair of illustrations of a Hawksbill Turtle; the dorsal view appears in the proceeding folio [page 192 (199 recto)].

As noted previously, Coenen's quoted French text is taken without attribution from Belon's 1555 French edition (Belon 1555). Belon cites Pliny, who writes of turtles,

Sunt ergo testudinum genera terrestres, marinae, lutariae, et quae in dulci aqua vivunt. Has quidam e Graecis emydas appellant.

So there are various kinds: tortoises that live on land, in the sea, in muddy water, and in fresh water. The last are called by some Greeks emydes. (Rackham 1963)

Fig. 15. Comparison of Adriaen Coenen's "sea eagle" from the *Visboeck* [Folio 193 (200 verso)] (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek) (**Top Left**), *Walvisboeck* Folio II (26 recto) (Coenen 1584) (Courtesy of the Erfgoedbibliotheek Hendrik Conscience, Bruikleen Koninklijke Maatschappij voor Dierkunde Antwerpen) (**Top Right**), Cornelis Bos's 1548 frieze *The Triumph of Neptune* (Courtesy of the Rijksmuseum) (**Bottom Left**), Arnold Nicolai (Nicolai 1558) (Courtesy of Herzog August Bibliothek Wolfenbüttel) (**Bottom Center**), Michaelis Tramezzino (Tramezzino 1558) (Courtesy of University Library at UiT, The Arctic University of Norway) (**Bottom Right; Upper-Left**), Abraham Ortelius (Ortelius 1564) (Courtesy of Basel University Library, Kartenslg) (**Bottom Right; Upper-Right**), Abraham Ortelius (Ortelius 1567) (Courtesy of Basel University Library, Kartenslg) (**Bottom Right; Lower-Left**), Michaelis Tramezzino (Tramezzino 1567) (Courtesy of Bayerische Staatsbibliothek, Digitale Bibliothek/Münchener Digitalisierungszentrum, CC BY-NC-SA 4.0) (**Bottom Right; Lower-Right**).



zeearent of beter eenen grooten sciltpadde ende hij greepse daer se was cruijpende op de strange ende was gecomen utter zee Hij hadde een bec als een arent ende vlogelen in manieren van vinnen ende achter in de plaets van die voeten platte vinnen gelijc voeten ende hadde eene groote scelpe opt lijf gelijc die scilpaddens hebben daer hij uut ende in croep het hooft in en uut hadde. Die scillip was van der groote als een becken van een berbier. [Du]

Ende ic cost hem vanden voorscreven man voor ses karolus guldens en hij was lanck levendich bij mijn ic sonder daarna een mede uut omte laten besien om gelt ende hij quam mijn doot tuijs ende ic dede hem dat ingewant uut ende droochde hem zijn ingewant was en hadde darmen ende ander ingewant als van een vogel Ic hadde hem in een tobbe met water lanck levendich gehouden maer hij en wilde niet eeten Als ic hem aldus gedroecht hadde soe creech mijn heer van Moerken (=Moerkerken) alias mijnheer van Renouteren een banroes heer in Vlaenderen hem van mijn. Desen [...] [Du]

< next page >

[...] goeden heere was een groot beminder van selsame vremde dinghe van visschen ende vogelen. Hij hadde twee scilders die hem alle dagen selsame vogelen ende visschen uitschilderde dese scilders hadde hij al binnen zijn hof Dese goede heere gaf mijn zijn tafel soe langhe als hij in den Haghe lach bijnaest een hallif jaere ende lach gelogeert opt Hof inde staethouders kamer. [Du]

Hij hadde een groot proses in den Haech als ick hoorde dese goede heere als hij mijn seijde hadde een huis binnen

like the tortoises. His head moved in and out. The shell was the size of a barber's bowl.

I bought the tortoise from this man for six Carolus guilders and kept him in my home for a long time. Afterwards I sent someone out with it to put it on show for money, and he brought it back dead. I disembowelled it and dried it. The intestines were like those of a bird. I had kept him alive for a long time in a tub of water, but he would not eat. When I had dried him, I gave him to Mylord of Moerkercke alias Mylord of Renouteren, a noble gentleman in Flanders. This [...]

< next page >

[...] good lord was a great lover of rare and strange things concerning birds and fish. He had two painters who illustrated rare birds and fish for him every day. He had this painter daily in his court. This good lord entertained me at his table during his stay in The Hague, almost half a year.

He was staying there in the Stadholder guest rooms. He was in The Hague for a big court case. As this gentleman told me, he had a house in Ghent and in Bruges and other courts and seignories as well as wonderful mazes and gardens about which wondrous tales could be told. Here in The Hague he had a large retinue of servants and six or eight fine stallions and horses, cooks and pages, and a beautiful young wife. He was an impotent man, bothered by gout but he was a Latin scholar who greatly loved art and science and was very curious about rare and strange things.

Gent ende Brugge ende een ander hoven ende heerlickheden buuten ende scoonen doolhoven ende tuijnen daer men wonder af wiste te seggen Hij hadde hier in den Haghe een grooten scaer van knechs ende vi of viii paerden ende kocx ende pagens Een jonge vrouwe die schoon was maer hij was een impotent man gequelt van fleercijn. Maer het was als ic sach een geleert man ende zeer gaeren const ende wetenscap be-minde ende zeer begeerich na selsame vremde dinghen. [Du]

Noch voor desen tijt hebbe ic noch eenen aldusdanichen zee arent ghesien binnen de stadt van Delft op een omme ganx dach ende dese was van gelijcke wesen ende forme als dese den mijne voorscreven Ende men sach hem om gelt ende lach levendich in eenen tobbe met waters. [Du]

Noch voor desen tijt hebbe ic geweest in de stede van Schiedam ten huse van eenen burgemeester en hadde een van Tack. Ende dese hadde een ceer geweest van een coep-schip ofte koopvaerder dat in verde landen om koepmanschap voer ende geweest hadde ende daer sach ic een groote scelp hangen van eenen aldusdanighen scilpadde of zee ar-ent Dese scelp was wel vier mael grooter dan desen scelp van desen scelpadde ende als mijn daer geseijt worden hadde die bootsgesellen van desen coepvaerder ande barberosse zijde een deel gesellen opt lant geroijt met een cleijn boote ende vonden in den duijnen ende geberchte sitten desen scilpadde sitten broeden op veel eijeren meer dan hondert als sij seijden Ende greepen hem en brochten hem te scep met alle zijn ei-jeren ende alsij seijde aten die eijeren ende dit was een scelp van dit beest dat ic daer sach. [Du]

Mais de toutes les especes de tortues, il n'y en a point qui ayt la chair si delicate, ne si saine, que celle des boysz et montaignes, que l'on appelle terrestres et nemorales; qui sont celles que les medicines ordon-nent aux maladies fort debilitez et hecticques. L'on en trouve beaucoup en Thrace et en Macedoine; et encor en ce paijs de Languedoc. Elle ressemble en tout a la tortue ronde de mer, ou de fleuve; reste qu'elle n'est pas si grande. [Fr; source: Belon 1555]

J'aij veu un autre espece de tortues en Turquie que lon disoit avoir este apportee de loingtain paijs, de laquelle le tais estoit transparent et de couleur doree. Dont les Turcs font de beaulx manches aux allumelles de leurs cousteaux, dagues et quelques autres instruments de guerre, et en font grand comptes, jusques a les garnir et enrichir de filets et petits cloux d'or et d'argent a la facon du paijs. [Fr; ibid]

Before that I had once seen such a sea-eagle in Delft on a pro-cession day, and it looked just like the one I have described here. This tortoise in Delft was on show for payment and was alive in a barrel of water.

Earlier still I visited the home of a burgomaster in Schiedam who had the shell of a tortoise that had once belonged to a big merchant who traded with distant countries. In this house of burgomaster Tack I saw a big shell of a tortoise or sea-eagle hanging. This shell was four times the size of mine and, so I was told, it had been found by fishermen who rowed ashore with a small boat and discovered tortoises there in the dunes and hills sitting on a big pile of eggs, more than a hundred, they said. They grabbed one tortoise and took it to the boat with all its eggs, and the shell I saw was from that creature. So there are big tortoises in distant countries.

But of all kinds of turtles none has such delicate or healthy meat as the wood or mountain turtle, which are called terrestrial or nemoral. These are the ones that physicians prescribe for patients who are very weak or perturbed. They are common in Thrace and Mace-donia, and also in the region of the Languedoc. They strongly resemble the round sea or river turtle, but they are smaller.

I have seen yet another type of turtle in Turkey, which was said to have been brought from a country far away; its head was transparent and gold-coloured. The Turks use it to produce beautiful handles for the blades of knives, daggers and other instruments of warfare, and prize it highly, and they even decorate and enrich them with small golden or silver nails as is the custom in their country.

Possible Source Material: Cornelis Anthoniszoon's 1543 *Caerte van oostlant* [illustration], Cornelis Bos' 1548 *The Triumph of Neptune* [illustration] (Bos 1548), Pierre Belon's 1555 *La nature et diversité des poissons* [text] (Belon 1555), Michaelis Tramezzino's 1558 *Septentrionalium Regionum Suetiae Gothiae Norvegiae Daniae et terrarum adiacentium recens exactaque description* [illustration] (Tramezzino 1558), Arnold Nicolai 1558 *Caerte van oostlant* [illustration] (Nicolai 1558), Abraham Ortelius' 1564 *Nova Totius Terrarum Orbis Iuxta Neotericorum Traditiones Descriptio* [illustration] (Ortelius 1564), Abraham Ortelius' 1567 *Asiae orbis partium maximae nova descriptio* [illustration] (Ortelius 1567), and Michaelis Tramezzino's 1567 *Septentrionalium Regionum Suetiae Gothiae Norvegiae Daniae et terrarum adiacentium recens exactaque description* [illustration] (Tramezzino 1567).

Notes: Again, as before, Coenen's quoted French text is taken without attribution from Belon's 1555 French edition (Belon 1555); the second passage is most likely a reference to the milleniums-old global Hawksbill Tortoise (*Eretmochelys imbricata*) tortoiseshell trade (Bjorndal 1995, Carr 1995, Spotilla 2005).

Coenen's 1577 imaginary "sea-eagle" can be traced back to one of two sources. In 2013, cartography historian Chet Van Duzer traced the origin of "sea-eagles" in Renaissance maps, where such creatures frequently kept company with other "sea monsters" like sirens, marine pig-dogs, and ichthyocentaurs, to two maps of Scandanavia (Van Duzer 2013): Arnold Nicolai's 1558 *Caerte van oostlant* (Nicolai 1558) and Michaelis Tramezzino's 1558 *Septentrionalium Regionum Suetiae Gothiae Norvegiae Daniae et terrarum adiacentium recens exactaque description* (Tramezzino 1558). Both maps were later editions, or copies, of an earlier map, mapmaker Cornelis Anthoniszoon's (also, Anthonisz) original 1543 *Caerte van oostlant* of which no copies exist today (Van Duzer 2013), and both feature a "sea-eagle" in their respective top left panels. Van Duzer proposed that the flying turtle depicted in the top-left panel of Nicolai's map was likely a reference to the map publisher, whose cartouche in the bottom-right panel – which reads "Antwerpia per Arnoldum Nicolai, ad insigne Testudinis" ("In Antwerp by Arnold Nicolai at the sign of the turtle") – was surrounded by four turtles (Van Duzer 2013).

This explanation seems unlikely, however, since there is little likeness between the "sea-eagle" and the turtles in the cartouche. Furthermore, Tramezzino's 1558 "Venice" edition alone is believed to be an exact copy of Anthoniszoon's origi-

nal 1543 "first" edition (Lang 1986), suggesting the origins of the "sea-eagle" predate the cartouche.

Later cartographic works that include variants of this "sea-eagle" include Abraham Ortelius' 1564 *Nova Totius Terrarum Orbis Iuxta Neotericorum Traditiones Descriptio* (world map) (Ortelius 1564) and 1567 *Asiae orbis partium maximae nova descriptio* (map of Asia) (Ortelius 1567), and Michaelis Tramezzino's 1567 *Septentrionalium Regionum Suetiae Gothiae Norvegiae Daniae et terrarum adiacentium recens exactaque descriptio* (map of Scandanavia) (Tramezzino 1567).

Although Coenen may have chanced upon any one of these maps of Amsterdam, he may also have come across the image for sale in the streets as an engraving during his frequent visits to The Hague in the Netherlands. The genesis of this "sea-eagle" has also been traced to Flemish engraver Cornelis Bos' 1548 frieze *The Triumph of Neptune* (Bos 1548), an example of the ornamental art style known as the Netherland Grotesque that emerged ca. 1540 pioneered by Flemish artists and their re-imagination of Italian grotesques (Bettelheim 2023). Therein, a winged turtle hangs in the skies of Bos' three-paneled frieze overlooking the Roman god Neptune and his tritons/mermen astride their serpent-tailed and web-footed sea-horses and a swirling host of sea creatures. Artists and dealers commonly sold engravings such as this to collectors and merchants in the Netherland market during the sixteenth century (Schéle 1965, De Marchi and Van Miegroet 2006).

The origins of the term "sea-eagle" in regards to marine turtles (or imaginary "sea monsters"), a term typically reserved in the ornithological community to describe fish-eating birds-of-prey like osprey and eagles (for example, see Willughby 1678), are uncertain and may represent a nomen nudum coined by Coenen. At its core, the simplest explanation is the interpretation that a sea turtle's flippers might be mistaken by some for wings (Bettelheim 2023) or that it was only natural for early naturalists to draw a comparison between the two, as does Dutch physician and naturalist Willem Piso who observes that marine turtles have feet like wings ("Testudo marina: loco pedum habet quasi alas.") (Piso 1648).

The noble gentleman "Mylord of Moerkercke alias Mylord of Renouteren" is known to be Bruges resident Charles de Saint Omer (1533-1569), a nobleman and naturalia collector responsible for assembling the *Libri Picturati*, one of the largest known European collections of botanical and zoological watercolours (Egmond 2018).

Turtle Species: Loggerhead Turtle (*Caretta caretta*; Linnaeus, 1758)

Source: *Visboeck* (1577)

Folio (Page): 162 (171 recto) [text] and 297 (300 recto) [text and illustration]

Representative Illustrations: Figure 16

Corresponding Book (Folio) in *Walvisboeck* (1584): II (25 recto)

Text:

Original (Dutch, German)

Van den groote schilt krote is ghefigureert folio 297 Daer-
mede men van de schilpen husen maeckt. [Du]

Hier wat gheschreven van die groote schiltpadde daermede
van zijn schilp husen af maeckt ende oock scheepen. [Du]

Cunraet Forer Een hoechduits scrijft aldus. [Du]

Die Schiltkrotten so ausz dem Meer gefangen wer-
dend sind den irdische ganz änlich und gleich gestalt-
et alleijn dasz sij an etlichen orten zu sölcher grösse
kommend als beij den Insulen Tabrobanae un in dem
Indianischen meer, dasz ein schalen ein gantzes hausz
bedeckt und die ejnwoner dieselbige brauchen anstadt
der schiffen. Man sacht sij sunst gaer an allen orten
des Meers. Habent eind harte und zerbrüchliche gan-
tze schalen order deckel unden und oben Dese grosse
Schiltkrotte wonend in den schrofen un velsen stein-
achten orten des Meers lasend sich zu zeijten auff das
trocken gestadt her auf: dan sie mussend auch luft ha-
ben in sonders beij der nacht zu welcher zeijt sij irer
speijs nach halten als nach dem kraut und dergleichen.
Sonst gläbend sij auch der Muschelfischen: dan so
ein starck gebiss haben sij dasz inen nichts widerston
mag. Auff dem trocknen boden in dem sand merend sij
sich legen auch ire eijer daerijn welche von der werme
der Sonnen aus gebrutet werdend dareijn der eijer leg-
end sij bis auff die 200 in ein grüben in der grösse als
ganse eijer. [Ge; source: Forer 1583]

Haer vleijs tot spijsse gebruickt ende oock die eijeren. Ic heb-
be luiden gesproken die der eijer gegeten hadde. [Du]

{Labels: Noch van dese groote schelpen gescreven folio 162
[Du]}

TESTUDO MARINA. Inden Indiaenschen zee zijn dese
schiltpaddens haer schilpen soe groot dat die inwoender daer
huissen ende schepen af maken Ende men vanckt se an allen
oorten van der zee aldaer. [Du]

Dese schiltkrotten eeten die Inwoonders van Indien heeft
goet vleis smaect als kalfsvleis. [Du]

English Translation

A picture of the big turtle is on folio 297. With its shells hous-
es are made

Here is written something about the big turtle with whose
shells houses are made and also ships.

Conrad Forer a High German writes the following:

Turtles that are caught in the sea are quite similar to
turtles on land and have the same shape, except that
in various places they grow to such a large size, for
instance on the island Tabrobana and in the Indian Sea,
that their shell covers a whole house, and that the in-
habitants use them as boats. It is said that they can be
seen in many parts of the sea. They have a hard and
fragile complete shell or lid, above and below. These
large turtles live in rugged and rocky locations in the
sea; now and then they move onto dry land because
they also need air, especially by night, which is the
time when they forage for food, such as herbs. They
also eat mussels, and they have such strong teeth that
nothing withstands them. They mate on dry sand and
also deposit their eggs in it, which are hatched by the
heat of the sun. They lay up to 200 eggs in a hole and
these have the size of goose eggs.

Their meat is used as food and also their eggs. I have spoken
with people who had eaten their eggs.

{Labels: Also written about these large shells folio 162}

TESTUDO MARINA. In the Indian Sea the shells of these
turtles are so big that the inhabitants make houses and boats
from them. They are caught in many parts of this sea.

The inhabitants of India eat these turtles, they have good
meat, tastes like veal.

Possible Source Material: Conrad Gessner and Felix Platter's 1516–1565 *Gessner-Platter Albums* in the Allard Pierson [illustrations] (Gessner 1516–1565), Conrad Gessner's 1558 and 1587 *Historiae animalium* [text/illustration] (Gessner 1558, Gessner 1587), and Conrad Forer's 1583 *Thierbuch* [text/illustration] (Forer 1583).

Notes: Historically, “testudo marina” was the acknowledged Roman ethnobionym, or folk taxon, for marine turtles, including the Green Turtle, Loggerhead Turtle, and Leatherback Turtle (Guasparri 2022). Today, the name “*Testudo marina*” is considered an invalid junior synonym to the presently accepted nomenclature, Loggerhead Turtle (*Caretta caretta*; Linnaeus, 1758) (Dubois and Bour 2010, Guasparri 2022). Later adaptations of Gessner's *Vorlagen* watercolor (namely, Garsault's 1764 *Testudo marina*) have been reviewed and, while Garsault's drawing was notably “not especially accurate,” it was nonetheless determined to be consistent with the Loggerhead Turtle based on the elongated carapace and first supernumerary costal scute (Dubois and Bour 2010).

As described previously regarding the “Tortuka” [see Folio 191 (198 verso) and Folio 192 (199 recto)], the most probable turtle from which houses and boats were repurposed from its shell is the Leatherback Turtle, rather than the Loggerhead Turtle illustrated here that Coenen directs his readers to.

The quoted German text originates from Conrad Forer's *Thierbuch* (Forer 1583), the German translation of Conrad Gessner's work (Gessner 1558, Gessner 1587). Gessner (and Forer) appear to be summarizing the work of Pliny's *Naturalis Histo-*

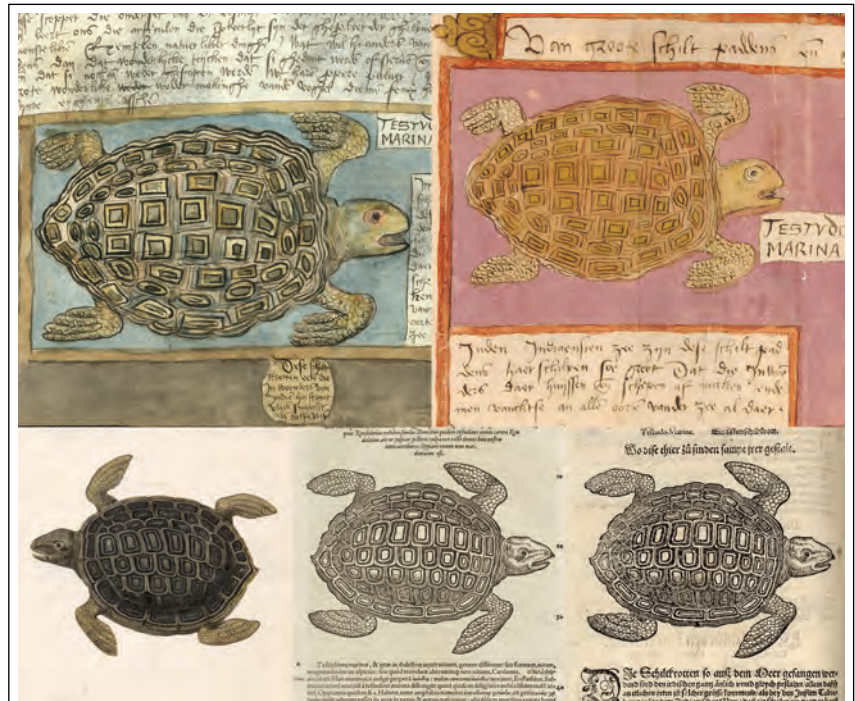


Fig. 16. Comparison of Adriaen Coenen's Loggerhead Turtle from the *Visboeck* [Folio 297 (300 recto)] (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek) (**Top Left**), *Walvisboeck* Folio II (25 recto) (Coenen 1584) (Courtesy of the Erfgoedbibliotheek Hendrik Conscience, Bruikleen Koninklijke Maatschappij voor Dierkunde Antwerpen) (**Top Right**), the Gessner-Platter Albums (Gessner 1516-1565) (Courtesy of Allard Pierson, University of Amsterdam; Hs. III C 23, folio 88r) (**Bottom Left**), Conrad Gessner (Gessner 1558) (**Bottom Center**), and Conrad Gessner (Gessner 1583 edition of Gessner 1563a) (**Bottom Right**).

ria (Pliny 1469). The island of “Tabrobanae” (also Taprobana, Taprobane) called out therein refers to the present-day country of Sri Lanka in the Indian Ocean. As far back as the Roman Augustan era (63 BC–14 AD), the Greek historian Strabo noted that “Taprobane sends great amounts of ivory, tortoise-shell and other merchandise to the markets of India” (McLaughlin 2014).

Turtle Species: “Troglodytic Turtle” (*imaginary*), European Pond Turtle (*Emys orbicularis*; Linnaeus 1758), “Chersinas” Land Turtle

Source: *Visboeck* (1577)

Folio (Page): 397 (399 recto)

Representative Illustrations: Figures 17 – 19

Corresponding Book (Folio) in Walvisboeck (1584): II (26 recto)

Text:

Original (Dutch, German)

{Labels: Schiltkrotten wer von den Troglodyten aengebetet [Ge]}

In dem Meer an der Trogloditen Insel gibts Schiltkrotten die haben vorne lange bewegliche hörner welcher sie sich im schwimmen gebrauchen unnd sise Schiltkrotten nennet man Celtien sind uber die masssen grosz aber seltzam Die hohe scharpfte felsen hinder welchen

English (translation)

{Labels: Turtles that are worshipped by Troglodytes}

In the sea of the Troglodyte island there are turtles with long mobile horns that they use to swim; they are called Celtien, which are very large but rare. The high and sharp rocks behind which they live make the fishermen fear that the turtles may pursue them.

si sich enthalten bringen des fischern schrencken dasz sie inen auch nachsetzen können. [Ge; source: Heyden 1565]

Zu den Troglodyten schwimmen sie one scheuhen hin und werden vonn den selbigen leuten gleich as ob sie heijlige Götter weren angebettet. [Ge; ibid]

{Labels: Testudo lutaria – Ein süsswasser oder Fluss schiltkrott [Ge]}

Diese Schiltkrotte sol ein schwarze Schale haben von etlichen kleinen tässelin züsamen geflickt verschliesse sich in die scalen gleich den irdischen schiltkrotten. [Ge; source: Gessner 1558]

Men vint gheen schiltpaddens die hier bij ons int water off opt land genereeren maer worden gebracht wt ander landen. [Du]

Auff dem Lande gibt es auch Schiltkrotten die man derhalben Chersinas das ist Erdschiltkrotten nennet und zum grossen wercken brauchet wohnen in der wildtnis des Affricanischen Landes sonderlich an deme ort da es sandig ist, behelffen sich wie man glaubet der feuchtigkeit des Tauwes unnd es fallen auch umb dieselbige gegend keine andere Thier. [Ge; source: Heyden 1565]

Plinii Lib. 32 Cap. 4 die Schiltkrotten [ernähren¹] sich beijde im Wasser und auffem lande Es sind aber ihrer mancherleij geschlecht, denn etliche erhalten sich auff dem Erdreich etteliche schwimmen im hohen meer etteliche ligen im Mosz und etteliche haben ihr wesen in den sussen wasser. Ihr fleisch gekocht unnd in einer Brü genossen sol den Kropff das Miltz stechen und den fallende siechttag vertreiben. Ir blut angestrichen erleuteret die augen und in wein getruncken ist es eind bewerte artzneij fur alles giff. [Ge; ibid]
Nicolaus Myrepsus: wenn du einem den Wein wilt erleiden so nim ein lebendige Schiltkrott wäsche sie eine zeit lang in guten wein ab, todte sie als denn, und gib ihr blut dem selbigen one sein wissen, drei morgen wenn er noch nuchtern ist, in einem bächer weins zu trincken so wirstu wunder sehen. [Ge; ibid]

Ihr Gall mit honig angeschmirt vertreibt den stern unnd alle andere flecken der augen. [Ge; ibid]

¹ Here Coenen forgot to copy the verb ernähren from the German Pliny text.

They swim fearlessly to the Troglodytes and are worshipped by them as if they were Gods.

{Labels: Testudo lutaria – a fresh-water or river turtle}

This turtle is said to have a black shell that is composed of several small pieces. It closes itself into its shell just like land turtles.

Here with us (in Holland) there are no turtles living either in the water or on land, but they are brought here from other countries.

On land there are turtles as well, which one therefore calls Chersinas, that is land turtles, and used for great works. They live in the wilderness of Africa, especially in sandy places. They are believed to make do with the moisture of the dew, and in these areas no other animals occur.

Pliny Lib. 32 Cap. 4, Turtles [find their food] both in water and on land. There are many kinds of turtles. Some live on land, some swim in the open seas, some hide in the moss, and some live in fresh water. Their meat, boiled and eaten as broth, is supposed to counteract goitre, pains in the spleen, and falling sickness. Dabbing with their blood clears up the eyes, and drunk mixed with wine it is an antidote against all kinds of poisons.

Nicolaus Myrepsus: When you want to tamper with someone's wine, take a live turtle and rinse it for a while with good wine; then kill it, and give that person its blood mixed in a beaker of wine, without him being aware of it, on three mornings when he has not yet eaten anything, and you will see some wondrous things.

Dabbing turtle gall mixed with honey will banish stars and all other spots from the eyes.



Fig. 17. Comparison of Adriaen Coenen's "Troglodytic Turtle" from the *Visboeck* [Folio 397 (399 recto)] (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek) (**Top Left**) and *Walvisboeck* Folio II (26 recto) (Coenen 1584) (Courtesy of the Erfgoedbibliotheek Hendrik Conscience, Bruikleen Koninklijke Maatschappij voor Dierkunde Antwerpen) (**Top Right**).

Possible Source Material: Guillaume Rondelet's 1554–1555 *Libri de piscibus marinis* [illustration] (Rondelet 1554–1555), Conrad Gessner's 1558 *Historiae animalium*. Liber 4 [text/illustration] (Gessner 1558), Johannes Heyden's 1565 *Caj Plinij Secundi, Des fürtrefflichen Hochgelehrten Alten Philosophi, Bücher vnd Schrifften, von der Natur, art vnd eigentschafft der Creaturen oder Geschöpfe Gottes* [text] (Heyden 1565), Conrad Forer's 1583 *Thierbuch, Das ist ein kurtze beschreybung aller vier Conrad füßigen Thieren, so auff der erden vn[d] in wassern wonend* [illustration] (Forer 1583), Johannes Heyden's 1584 *Caj Plinij Secundi, Des fürtrefflichen Hochgelehrten Alten Philosophi, Bücher vnd Schrifften, von der Natur, art vnd eigentschafft der Creaturen oder Geschöpfe Gottes* [text] (Heyden 1584), and Conrad Gessner's 1587 *Historiae animalium*. Liber 5 [text/illustration] (Gessner 1587).

Notes: The bulk of the quoted German text can be traced to Johannes Heyden's 1565 German translation of Pliny the Elder's *Naturalis Historia* (Heyden 1565). Therein, Pliny describes what Kitchell and Rhodin (1996) have since coined a "Troglodytic turtle", depicted by Heyden, Coenen, and others as a fish with a spiral turban shell. The basis for this snail-like creature as either a turtle, another animal entirely, or simply a sea-monster is entirely unknown (Fig. 17).

Rackham's translation of Pliny, which offers little more in the way of illumination regarding this passage, reads:

The Cavemen have horned turtles with broad horns twisted inward like those of a lyre but movable, which

they use as oars to aid themselves in swimming; the name for this horn is *chelum*; it is of tortoise shell of exceptional quality, but it is seldom seen, as the very sharp rocks frighten the Turtle-eater tribe, while the Cavemen, on whose coasts the turtles swim, worship them as sacred. (Rackham 1938)

One interpretation of this passage describing turtle "horns" proposed by French naturalist Georges Cuvier [whose notes were incorporated into Lemaire's and de Grandsagne's translations of Pliny (Bostock 1855)] proposed the sea turtle's long, narrow, pointed front feet were likely mistaken for horns (de Grandsagne 1830, Bostock 1855).

According to Brewer's *Dictionary of Phrase and Fable*, the Troglodytes, as described by Pliny and Strabo, were a people of Ethiopia south-east of Egypt, who lived in cave dwellings along the banks of the Nile (Brewer 1894).

Below the "Troglodytic turtle" appears the childlike "testudo lutaria" illustration (Figure 18). Historically, "testudo lutaria" was the acknowledged Roman ethnobionyn for mud turtles, specifically the European Pond Turtle (*Emys orbicularis*) (Guasparri 2022). Today, the name "*Testudo lutaria*" is considered an invalid junior synonym to the presently accepted nomenclature, European Pond Turtle (*Emys orbicularis*; Linnaeus, 1758) (Fritz and Havaš 2007). Unquestionably one of Coenen's cruder reproductions, it is nonetheless consistent with the Rondelet (1554–1555) and Gessner (1558) source materials.

Pliny's description of "Chersinas [turtles]... in the wilderness of Africa" may very well be an early reference to

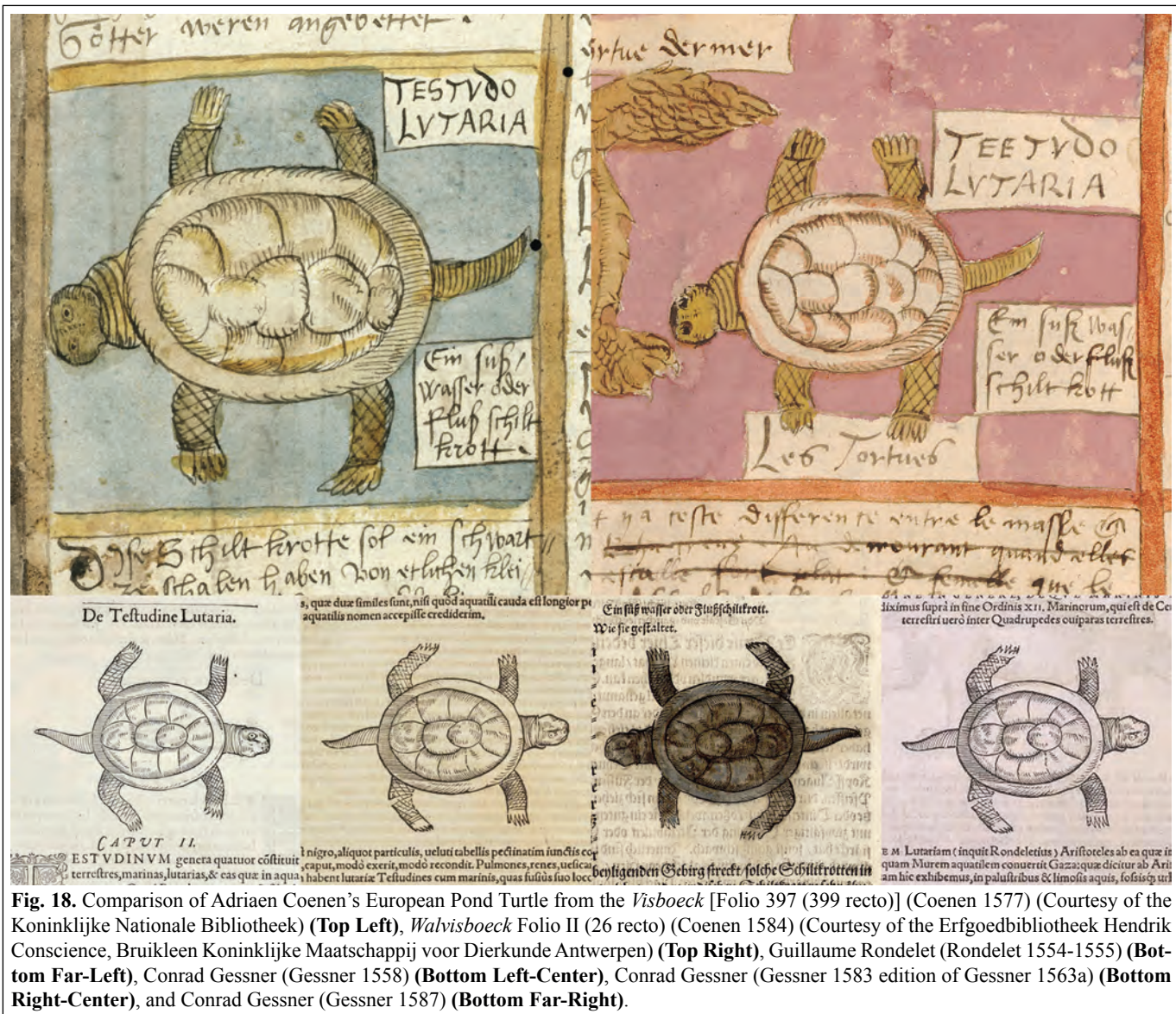


Fig. 18. Comparison of Adriaen Coenen's European Pond Turtle from the *Visboeck* [Folio 397 (399 recto)] (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek) (**Top Left**), *Walvisboeck* Folio II (26 recto) (Coenen 1584) (Courtesy of the Erfgoedbibliotheek Hendrik Conscience, Bruikleen Koninklijke Maatschappij voor Dierkunde Antwerpen) (**Top Right**), Guillaume Rondelet (Rondelet 1554-1555) (**Bottom Far-Left**), Conrad Gessner (Gessner 1558) (**Bottom Left-Center**), Conrad Gessner (Gessner 1583 edition of Gessner 1563a) (**Bottom Right-Center**), and Conrad Gessner (Gessner 1587) (**Bottom Far-Right**).

the Angulate or South African Bowsprit Tortoise (*Chersina angulata*) of southern Africa, or more generally to any of Africa's other Testudinidae. Although the genus *Chersina* wasn't assigned to any of the Testudinidae prior to 1820 (Merrem 1820; Gray 1831, Hofmeyr 2009), Pliny's use may simply have been descriptive, as *Chersinos* in Greek means living on dry land (Bour and Ohler 2008). Heyden's (1565) translation introduces an unlabeled illustration (Fig. 19) copied by Coenen that may have been intended to illustrate such "Chersinas" land turtles.

At one point, Heyden's translation of Pliny (and transcribed by Coenen) is imprecise; when Heyden writes, "Auff dem Lande gibt es auch Schiltkrotten die man derhalben Chersinas das ist Erdschiltkrotten nennet und zum grossen wercken brauchet..." (Heyden 1565), the English translation

awkwardly reads "On land there are turtles as well, which one therefore calls Chersinas, that is land turtles, and used for great works..." In a separate translation of Pliny from the original Latin to English, Rackham translates this very same phrase as "There are also turtles living on land, and consequently called in works on the subject the Terrestrial species..." (Rackham 1938), presenting a more logical interpretation of the original Latin text.

Nicolaus Myrepsus (also Nicholas Myrepsos) (1240-1280) was a Byzantine physician known for the *Dynameron*, a compendium of medical science that included 2,667 recipes, many of which were based on plants and animal parts. Among the animal parts mentioned in the *Dynameron* is the blood of the Green Turtle (*Chelonia mydas*) (Valiakos et al. 2021).

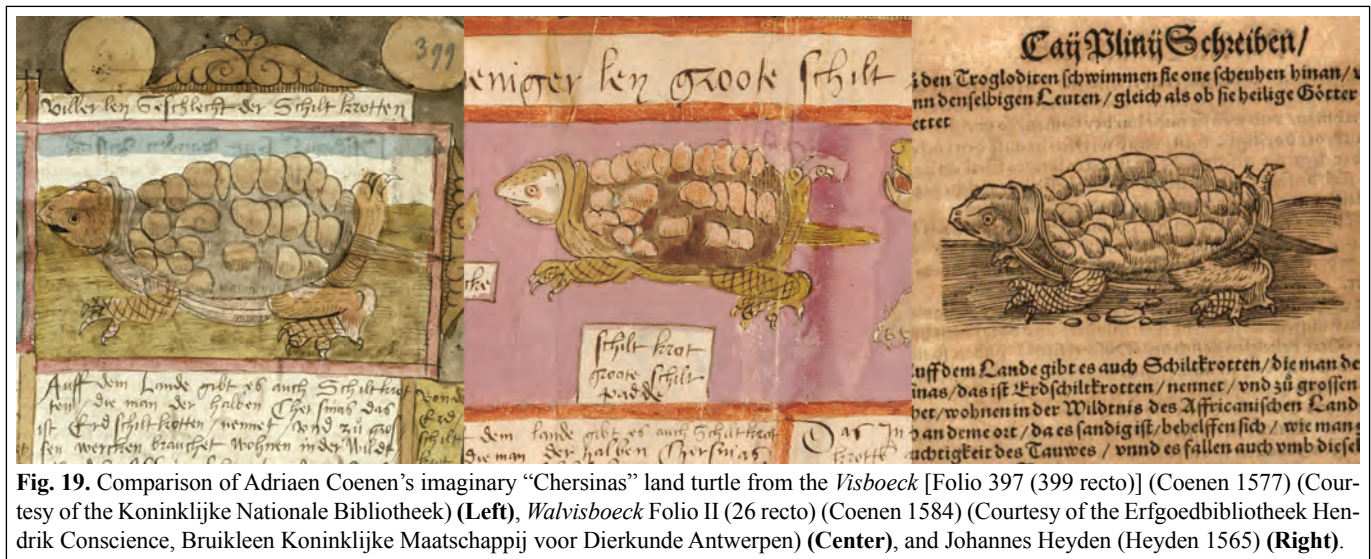


Fig. 19. Comparison of Adriaen Coenen's imaginary "Chersinas" land turtle from the *Visboeck* [Folio 397 (399 recto)] (Coenen 1577) (Courtesy of the Koninklijke Nationale Bibliotheek) (**Left**), *Walvisboeck* Folio II (26 recto) (Coenen 1584) (Courtesy of the Erfgoedbibliotheek Hendrik Conscience, Bruikleen Koninklijke Maatschappij voor Dierkunde Antwerpen) (**Center**), and Johannes Heyden (Heyden 1565) (**Right**).

ACKNOWLEDGEMENTS

Special thanks to Florike Egmond for assistance with the Dutch-, German-, Spanish-, and French-to-English translations of Adriaen Coenen's *Visboeck* and *Walvisboeck*; Patrick David for assistance with French translations; Nancy Grabow for assistance with German translations; Steven Van Impe (Erfgoedbibliotheek Hendrik Conscience), Jeroen Vandommele (Koninklijke Nationale Bibliotheek), and Christine Feld (Stadt Köln Historisches Archiv) for assistance with background information on Adriaen Coenen's manuscripts; Klass van der Hoek (Allard Pierson, Universiteit van Amsterdam) for assistance with Vorlagen in the Felix Platter collection; and Chet Van Duzer for his assistance with Renaissance map source material.

REFERENCES

- Aelian. 1959. *On the Characteristics of Animals: with an English Translation by A.F. Scholfield. Volume III.* Harvard University Press, Cambridge, MA. 445 pp.
- Belon, Pierre. 1553. *Petri Bellonii Cenomani De aquatilibus, libri duo cum [epsilon, iota] conibus ad viam ipsorum effigiem, quoad eius fieri potuit, expressis.* Parisiis, Apud C. Stephanum.
- Belon, Pierre. 1555. *La nature et diversité des poissons, avec leurs pourtraicts, représentez au plus près du naturel.* C. Estienne (Paris).
- Bettelheim, Matthew. 2023. The Cartographer's Turtle: The Grotesque Origins of Renaissance Map Turtles. *Bibliotheca Herpetologica* 17(11):108–115.
- Bjorndal, Karen A. (ed.). 1995. *Biology and Conservation of Sea Turtles (Revised Edition).* Proceedings of the World Conference on Sea Turtle Conservation. Washing, D.C. 2-30 November 1979. Smithsonian Institution Press, Washington, D.C. 615 pp.
- Bonaparte, Charles Lucian. 1832. *Iconografia della fauna italie: per le quattro classi degli animali vertebrati. Volume 2: Anfibi.* Tip Salviucci, Roma. 386 pp.
- Bos, Corneilus. 1548. *Fries met de triomf van Neptunus.* Rijksmuseum, Amsterdam.
- Bostock, John. 1855. *The Natural History of Pliny. Volume 2.* H.G. Boh, London. 555 pp.
- Bour, Roger and Annemarie Ohler. 2008. *Chersine Merrem, 1820 and Chersina Gray, 1831: A nomenclatural survey.* *Zootaxa* 1752:66–68.
- Brewer, Ebenezer Cobham. 1894. *Dictionary of Phrase and Fable.* Cassell, Petter & Galpin, London.
- Burstein, Stanley Mayer. 1989. *Agatharchides of Cnidus: On the Erythraean Sea.* The Hakluyt Society. Ashgate Publishing Company, Burlington, Vermont. 202 pp.
- Çakırlar, Canan, Francis Koolstra, and Salima Ikram. 2021. Tracking turtles in the past: Zooarchaeological evidence for human-turtle interactions in the ancient Eastern Mediterranean. *Antiquity* 95(379):125–141. doi:10.15184/aqy.2020.95
- Carr, Archie Fairly. 1995. *Handbook of Turtles: The Turtles of the United States, Canada, and Baja California.* Comstock Publishing Associates, Ithica, NY. 542 pp.
- Coenen, Adriaen. 1577-1579. *Visboeck [Visboeck].* Netherlands. 462 folios.
- Coenen, Adriaen. 1584. *Dat eerste boock van menich derleij walvischen ende ander selseme groote wonderlijke visschen [Walvisboeck].* Netherlands. 56 folios (Book1) and 66 folios (Book 2).
- Coenen, Adriaen. 1585. *Beschreibung von Walvischen, Rochen, Seehunden usw. - 16. Jh. (1585) [Haringkoningboeck].* 25 folios.
- Cohen, Simona. 2008. Renaissance Naturalists and Animal Symbolism: Fact and Fantasy. 23–33. In: Zwijnenberg, Robert. 2008. *Animals as Disguised Symbols in Renaissance Art.* Brill's Studies on Art, Art History, and Intellectual History. Volume 2. Brill, Boston. 316 pp.
- Cotgrave, Randle. 1611. *A Dictionarie of the French and English Tongues.* Adam Islip, London, England.
- de Grandsagne, Ajasson. 1830. *Histoire naturelle de Pline.* Volume 7. C.L.F. Panckoucke, Paris. 312 pp.
- De Marchi, Neil and Hans J. van Miegroet. 2006. The History of Art Markets. In: Victoria A. Ginsburgh and David Thorsby (Eds.), *Handbook of the Economics of Art and Culture, Vol. 1,* Amsterdam: Elsevier:69–122.
- Dubois, Alain and Roger Bour. 2010. The Nomenclatural Status Of The Nomina Of Amphibians And Reptiles Created By Garsault (1764), With A Parsimonious Solution To An Old Nomenclatural Problem Regarding The Genus Bufo (Amphibia, Anura),

- Comments On The Taxonomy Of This Genus, And Comments On Some Nomina Created By Laurenti (1768). *Zootaxa*. 1–52. 10.5281/zenodo.195113.
- Duméril, André Marie Constant. 1855. *Erpétologie générale, ou, Histoire naturelle complète des reptiles. Volume 2*. Librairie Encyclopédique de Roret, Paris. 680 pp.
- Egmond, Florike. 1997. *Een bekende Scheveninger: Adriaen Coenen en zijn Visboek van 1578*. University of Chicago Press. 174 pp. [with English summary]
- Egmond, Florike. 2013. A collection within a collection: rediscovered animal drawings from the collections of Conrad Gessner and Felix Platter. *Journal of the History of Collections* 25(2):149–170.
- Egmond, Florike and Peter Mason. 2003. *The Whale Book - Whales and Other Marine Animals as Described by Adriaen Coenen in 1585*. Reaktion Books, London, UK. 208 p.
- Egmond, Florike. 2018. On Northern Shores: Sixteenth-Century Observations of Fish and Seabirds (North Sea and North Atlantic). 129–148. In: MacGregor, Arthur (ed.). 2018. *Naturalists in the Field: Collecting, Recording and Preserving the Natural World from the Fifteenth to the Twenty-First Century*. Brill, Boston. 999 pp.
- Ernst, Carl H. and Roger W. Barbour. 1989. *Turtles of the World*. Smithsonian Institution Press, Washington, D.C. 313 pp.
- Frazier, John G., Valentina Azzarà, Olivia Munoz, Lapo Gianni Marcucci, Emilie Badel, Francesco Genchi, Maurizio Cattani, Maurizio Tosi, and Massimo Delfino. 2018. Remains of Leatherback turtles, *Dermochelys coriacea*, at Mid-Late Holocene archaeological sites in coastal Oman: clues of past worlds. *PeerJ* 6:e6123.
- Fritz, Uwe and Peter Havaš. 2007. Checklist of Chelonians of the World. *Vertebrate Zoology* 57(2):149–368.
- Gessner, Conrad. 1554. *Historiae animalium. Liber 2. De quadrupedibus ouiparis*. Tigvri [Zurich], Apvd Christ. Froshovervm.
- Gessner, Conrad. 1558. *Historiae animalium. Liber 4. Qui est de piscium & aquatiliu animantium natura : cum iconibus singulorum ad vivum expressis fere omnib*. Tigvri [Zurich], Apvd Christ. Froshovervm.
- Gessner, Conrad (Conrad Forer, translator). 1563a. *Thierbuch, Das ist ein kurtze beschreybung aller vier füßigen Thieren, so auff der erden vn[d] in wassern wonend*. Zürich, Froshover.
- Gessner, Conrad (Conrad Forer, translator). 1563b. *Fischbuch, Das ist Außführliche beschreibung, vnd lebendige Conterfactur aller vnnd jeden Fischen von dem kleinsten Fischlein an biß auff den größten Wallfisch wie sie nicht allein in dem grossen hohen Meer sondern auch in den Seen Flüssen Bächen vnd allen Schifffreichen Wassern gesehen vnd gefangen werden*. Cambier, Frankfurt am Meyn.
- Gessner, Conrad. 1516–1565. *Gessner-Platter Albums in the Allard Pierson*, University of Amsterdam. Hs. III C 23 (folios 86r and 88r).
- Gessner, Conrad. 1587. *Historiae animalium. Liber 5. De serpentium natura. Ex variis schedis et collectaneis eiusdem compositis per Jacobum Carronum... Adiecta est ad calcem, Scorpionies insecti historia a D. Casparo Vuolphio... ex eiusdem paralipomenis conscripta*, 1587. Tigvri [Zurich], Apvd Christ. Froshovervm. [pages 113, 114, 183, 184, 358]
- Gray, John Edward. 1831. *Synopsis Reptilium; or Short Descriptions of the Species of Reptiles. Part I.—Cataphracta. Tortoises, Crocodiles, and Enaliosaurians*. London: Treuttel, Wurtz & Co. 85 pp.
- Guasparri, Andrea. 2022. The Roman Classification and Nomenclature of Aquatic Animals: an Annotated Checklist (with a Focus on Ethnobiology). *Anthropozoologica* 57:19–100.
- Heyden, Johannes. 1565. *Cajj Plinij Secundi, Des fürtrefflichen Hochgelehrten Alten Philosophi, Bücher vnd Schrifftten, von der Natur, art und eigenschafft der Creaturen oder Geschöpfte Gottes*. Feyerabend und Hütter, Frankfurt am Main.
- Heyden, Johannes. 1584. *Cajj Plinij Secundi, Des fürtrefflichen Hochgelehrten Alten Philosophi, Bücher und Schrifften von der Natur, Art und Eigenschaft aller Kreaturen oder Geschöpfte Gottes*. Feyerabend, Frankfurt am Main.
- Hofmeyr, Margaretha D. 2009. *Chersina angulata* (Schweigger 1812) – Angulate Tortoise, South African Bowsprit Tortoise. In: Rhodin, A.G.J., Pritchard, P.C.H., van Dijk, P.P., Saumure, R.A., Buhmann, K.A., Iverson, J.B., and Mittermeier, R.A. (Eds.). *Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group*. Chelonian Research Monographs No. 5, pp. 030.1–030.6.
- Husby, Tristan K. 2017. *Recognizing Freedom: Manumission in the Roman Republic*. PhD. Dissertation. City University of New York. 315 pp.
- Kitchell, Kenneth F. and Anders G.J. Rhodin (Eds.). 1996. Books on Marine Fish, in which True Figures of the Fish are Presented. Book XVI. Chapters II–V. On Turtles. Guillaume Rondelet (1554). Translated and annotated from Latin. *Chelonian Conservation and Biology* 2(2):287–302.
- Lang, Arend Wilhelm. 1886. *Die “Caerte van oostlant” des Cornelis Anthonisz. 1543: Die älteste gedruckte Seekarte Nordeuropas und ihre Segelanweisung (Schriften des Deutschen Schiffahrtsmuseums)* (German Edition). Kabel, Hamburg, Germany. 167 pp.
- Mancini, Agnese, Islam Elsadek, and Magdy A.N. El-Alwany. 2015. *Marine Turtles of the Red Sea*. 10.1007/978-3-662-45201-1_31.
- McLaughlin, Raoul. 2014. Ancient Contacts: The Roman Emperor and the Sinhalese King. *Classics Ireland* 21–22:1–40.
- Merrem, Blasius. 1820. *Versuch eines Systems der Amphibien. Tentamen Systematis Amphibiorum*. Marburg: J.C. Krieger, 191 pp.
- Meydenbach, Jacob. 1491. *Ortus Sanitatis*. Mainz, Germany, Jacob Meydenbach.
- Nicolai, Arnold. 1558. *Caerte van Oostlant*.
- Nisbet, Robert G. 1918. The Festuca and the Alapa of Manumission. *The Journal of Roman Studies* 8:1–14.
- Ortelius, Abraham. 1564. *Nova Totius Terrarum Orbis Iuxta Neotericorum Traditiones Descriptio*.
- Ortelius, Abraham. 1567. *Asiae orbis partium maximae nova descriptio*.
- Page, Greek Ethelbert and William Henry Denham Rouse. 1912. *The Greek Bucolic Poets (with an English translation by J.M. Edmonds)*. The Loeb Classical Library. The Macmillan Co., New York, NY. 527 pp.
- Piso, Willem. 1648. *Historia Naturalis Brasiliae*. Lugdun. Batavorum, Apud Franciscum Hackium. 293 pp.
- Pliny [the Elder]. 1469. *[Naturalis Historia] Plinius Secundus Nouocomensis equestribus militiis industrię functus, procurationes quoque splendidas atque continuas summa integritate administravit*. Venice, Johannes de Spira.
- Prüss, Johann Strasbourg. 1497. *Ortus Sanitatis*. Strasbourg, Johann Prüss.
- Rackham, Harris. 1938. *Pliny - Natural History (with an English translation in ten volumes). Volume III, Libri VIII-XI*. Cambridge, Massachusetts, Harvard University Press. 617 pp.
- Rackham, Harris. 1963. *Pliny - Natural History (with an English translation in ten volumes). Volume VIII, Libri XXVIII-XXXII*. Cambridge, Massachusetts, Harvard University Press. 596 pp.
- Rings, Paulien. 2022. “De restauratie van het Visboek.” Nationale Bibliotheek. Accessed: March 3, 2023.

- Rondelet, Guillaume. 1554–1555. *Libri de piscibus marinis : in quibus veræ piscium effigies expressae sunt : quæ in tota piscium historia continentur, indicat elenchus pagina nona et decima : postremo accesserunt indices necessarij*. Lugduni, Apud Matthiam Bonhomme.
- Schéle, Sune. 1965. *Cornelis Bos: A Study of the Origins of the Netherland Grotesque*. Almqvist & Wiksell, Stockholm.
- Segal, Charles. 1973. *Simaetha and the Lynx (Theocritus, Idyll II)*. Quaderni Urbinati di Cultura Classica 15:32-43.
- Spotilla, James R. 2004. *Sea Turtles: A Complete Guide to Their Biology, Behavior, and Conservation*. Johns Hopkins University Press, Baltimore, MA. 227 pp.
- Thompson, D'Arcy Wentworth. 1910. *The Works of Aristotle: Historia Animalium. Vol 4*. Clarendon Press, Oxford, England. 633 pp.
- Topsell, Edward. 1658. *The History of Four-Footed Beasts and Serpents*. E. Cotes, London. 1130 pp.
- Tramezzino, Michaelis. 1558. *Septentrionalium regionum Suetiae, Gothiae, Noruegiae, Daniae et terrarum adiacentium recens exacta[que] description*.
- Tramezzino, Michaelis. 1567. *Septentrionalium Regionum Suetiae Gothiae Norvegiae Daniae et terrarum adiacentium recens exacta[que] description*.
- Valiakos, Elias, Marios Marselos, Maria-Eleni Grafakou, Helen Skaltsa, and Nikos Sakellariadis. 2021. Remedies of animal origin and their indications in Nikolaos Myrepsos' Dynameron. *Journal of Ethnopharmacology*. 276. 114191. 10.1016/j.jep.2021.114191
- van Doesborch, Jan. 1520. *Der Dieren Palley*s. Antwerpen, Jan van Doesborch.
- Van Duzer, Chet. 2013. *Sea Monsters on Medieval and Renaissance Maps*. British Library, London. 143 pp.
- van Maerlant, Jacob. 1340-1350. *Der naturen bloeme*. Netherlands. 168 pp.
- Willughby, Francis. 1678. *The Ornithology of Francis Willughby of Middleton in the County of Warwick, Esq; In Three Books*. A.C. for John Martyn, London. 441 pps.
- Winchester, Simon. 2009. *Outposts: Journeys to the Surviving Relics of the British Empire*. Harper Collins, New York, New York. 400 pp.

We suggest the following format for citing this article:

Bettelheim, M. P. 2024. *Het Schildpadboek: The Origins and Inspiration Behind the Turtle Watercolors of Adriaen Coenen's Visboek and Walvisboek*. *Bibliotheca Herpetologica* 18(1):1–29.



Hans Strøm's Norwegian Asp Viper (*Coluber aspis*): a misdiagnosed 18th century *Vipera berus*

László Krecsák

2051 Biatorbagy, Jokai Mor str. 14, Hungary. lkrecsak@gmail.com

Abstract. In the twelfth edition of *Systema Naturae*, Carl Linnaeus added a specimen described by Hans Strøm to his listing of *Coluber aspis*. The aim of this paper is to discuss the background, description, and details of this misidentified *Vipera berus* specimen described by the prominent Norwegian naturalist Hans Strøm from Sunnmøre in western Norway, together with a short biography of Strøm.

INTRODUCTION

The Asp Viper, *Vipera aspis* (Linnaeus, 1758) is a medium-sized venomous snake occurring in Spain, France, Germany, Switzerland, Italy, and Slovenia (Golay et al. 2008). In the tenth edition of *Systema Naturae*, Linnaeus (1758) described the species *Coluber aspis* (the French “aspice”) based on a single specimen. The twelfth edition of *Systema Naturae* (Linné 1766) type series included another specimen, described by the prominent Norwegian naturalist Hans Strøm (1762). The geographic area covered by Strøm in his book, Sunnmøre in western Norway, clearly indicates this specimen was misclassified. In the following, the description of this specimen by Hans Strøm, as well as his other works on vipers is reviewed and the fate of this specimen is discussed. Strøm’s description is of particular value since it is rare to find such detailed descriptions in encyclopedic publications of this period.

THE LINNAEAN DESCRIPTION OF *COLUBER ASPIS*

Coluber aspis was the species numbered 192 in the tenth edition of *Systema Naturae* (Linnaeus 1758) (Fig. 1). The description translates as follows: 192. (sum of ventral and subcaudal scales) venomous snake (Mars sign ♂, see Krecsák and Wahlgren 2008), *Aspis*, 146 ventral scales, 46 subcaudal scales. French “aspice”. Lives in France. Reddish, with dark alternative spots flowing together into a band. Like *Chersea*, but larger. (translation by Kitchell and Dundee 1994).

The description of the species in the twelfth edition of *Systema Naturae* (Linné 1766) is similar to the one in the tenth edition (Fig. 2) but with the addition of a new reference “Strøm. Sondm. Col. 146—34.” Based on the above descriptions we can draw two conclusions: At the time of writing the *Amphibia* section of the tenth edition (Linnaeus 1758), Linnaeus had seen a single *Coluber aspis* specimen on which he based the description of the species (the origin and fate of this specimen will be assessed in another publication). During the

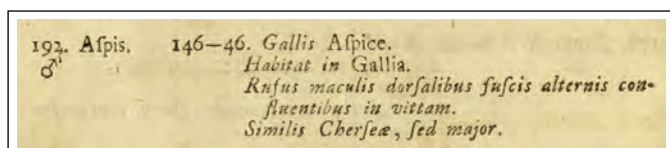


Fig 1. Description of *Coluber aspis* on page 218 of the tenth edition of *Systema Naturae*.

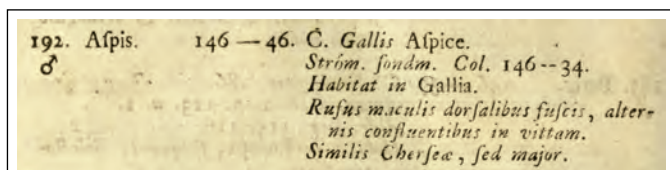


Fig 2. Description of *Coluber aspis* on page 378 of the twelfth edition of *Systema Naturae*.

update of *Systema Naturae* to twelfth edition (Linné 1766), Linnaeus added an additional snake from “Strøm. Sondm. Col.”, as a *Coluber aspis* specimen with 146 ventrals and 34 subcaudals.

THE STRØM. SONDM. COL.

Linné (1766) used “Strøm. Sond.” and “Strøm. Sondm.” to refer to the encyclopedic work “*Physisk og oekonomisk Beskrivelse over Fogderiet Søndmør, beligende i Bergens Stift i Norge. Oplyst med Landkort og Kobberstykker. Første part.*” by Hans Strøm (1762). All references to the publication included the relevant page number as well (e.g., *Trisopterus luscus* named *Gadus barbatus* in Linné 1766 Strøm. Sondm. 316 n. β). The citation under *Coluber aspis* is the only one for which Linnaeus did not provide a page number. We can only make assumptions for the reasons why only a partial citation is listed here, but the descriptions of the respective snakes are on pages 192 and 193.

We know that Linnaeus owned a copy of the book by Strøm (1762) years before the twelfth edition was published. Strøm provided a copy of his book to Linnaeus along with a letter (dated 8th September 1762) in which he wrote a highly

humble fashion about his book and glorified Linnaeus for his knowledge and work (Schjødte 1871 p. 436-437).

HANS STRØM (1726–1796)

Strøm (Fig. 3) was born 25 January 1726 in Borgund (now Ålesund), Møre og Romsdal county in western Norway, into a family of pastors, on both the maternal and paternal sides. He was the second of four siblings, with an older sister, a twin brother, and a younger brother. In his youth, Strøm had an interest in nature and enjoyed drawing. He attended the upper classes in the Bergen Cathedral School, and from 1743 the University of Copenhagen, and two years later received his degree in theology. In 1750 Strøm became a chaplain, his father's successor, as parish pastor in Borgund and served in this position for 14 years. He traveled extensively around Borgund and made multiple natural history observations in the area.

Linnaeus's publications and the two-volume "*Forsøk til Norges naturlige historie*" (The Natural History of Norway) by Erik Pontoppidan (1752, 1753) motivated Strøm to publish his observations and travels in the Sunnmøre area (Wal-løe 2024). This resulted in the publication which established him as a prominent naturalist in Norway: the two volumes of "*Physisk og Oeconomisk Beskrivelse over Fogderiet Søndmør*" [description of the district of Sunnmøre in Western Norway] printed in Denmark 1762 and 1766 (Strøm 1762, 1766). The first volume (Strøm 1762) contained information about the people and natural environment of the region, and provided details on the geography, topography, winds, commercial activities, fisheries or farming, boats, and detailed descriptions of the local flora and fauna. It also contained a detailed regional map of Sunnmøre drawn by Strøm. Reeploeg (2015) emphasized the regional detail is the remarkable element of the map drawn by Strøm. Place names are arranged in a visual catalogue that documents and itemizes the places in the coastal landscape, as well as the topographical landscape features of islands, mountains, and fjords. The second volume (Strøm 1766) covered the cultural aspects of the region.

Strøm co-founded the Royal Norwegian Society of Sciences and Letters (Det Kongelige Norske Videnskabers Selskab (DKNVS)) in 1760. In 1790, he received a doctorate in theology for his work on primitive Christianity. He was appointed a parish pastor in Volda in 1764 and served there until 1779. His last position was that of a vicar for the Eiker parish.

In 1784 he published another book similar to his Sunnmøre volume, about the Eiker parish "*Physisk-Oeconomisk Beskrivelse over Eger-Præstegjæld i Aggershuus-Stift i Norge*" (Strøm 1784).

Strøm passed away on 1 February 1797 in Hokksund, Eiker (now Øvre Eiker), Buskerud County, Norway.

Strøm published about 50 natural history articles on the flora and fauna of Norway, mainly focused on insects and bryophytes, and also described new taxa, such as *Phalaena funebris* Strøm, 1768 (= *Anania funebris* (Strøm, 1768)).



Fig 3. Hans Strøm, by Seehusen J.L. in 1791 after a painting by Peder Pedersen Aadnes. Image from Riksantikvarens fotoarkiv. Norway.

For a detailed review of his papers see Strand (1917). His publications were not limited to natural history, he published multiple volumes of sermons as well as books and articles on theology and social sciences. For a review of his theological works see Apelseth (1995) and Amudsen (2023). Hans Strøm can be regarded as Norway's first true naturalist (Apelseth 1995; Jørgensen 2010), his accomplishments being valued and appreciated in Norway even today (Fig. 4.).

COLUBER SPECIMENS IN THE STRØM COLLECTION

On pages 192 and 193 of "*Physisk og oeconomisk Beskrivelse over Fogderiet Søndmør, beligende i Bergens Stift i Norge. Oplyst med Landkort og Kobberstykker. Første part.*" (Strøm 1762, Fig. 5) he provided the description of a snake named "Guulfaening". While Strøm reported this snake to be as common as the so-called "Bue-Orm" *Natrix torquata* (= *Natrix natrix* (Linnaeus, 1758)), he deemed it necessary to provide a detailed description of the species, based on two specimens. Strøm writes:

Den saa kaldte Guul-Fræning er næst Bue-Ormen den almindeligste; men maa noget udførligere beskrives. Dens Længde er 1 Alen paa 2 Tværfingre nær, og Tykkelsen som en Mellemfinger. Hovedet er plat, og Stierten ganske spids. I Munden sidder oven og ned til en Rad fine Tænder, og foran i øverste Kæve endnu 2 lange og bevægelige Tænder



Fig. 4. 50 Norwegian øre stamp depicting Hans Strøm issued by Norges Banks Seddeltrykkeri, Oslo on October 15 1970.



Fig. 5. Cover of *Physisk og oeconomisk Beskrivelse over Fogderiet Søndmør, beliggende i Bergens Stift i Norge. Oplyst med Landkort og Kobberstykker. Første part..*

af Skikkelse som Katte-Kloer. Paa overste Deel af Kroppen ligge Skiællene i adskillige Rader, 21 Skiæl i hver Rad, alle aflange og mærkede med en ophøiet Stræg. Imellem Dinene sidde 3 Stial, som ere større end de øvrige, og under Hagen 2 temmelig store, dog noget mindre. Scuta abdominalia ere paa mit ene Exemplar 146, men paa det andet 148; og Squamæ caudæ paa det første Exemplar 34, men paa det sidste kun 30. Paa Kroppens Overdeel er Farven mestendels rodagtig-brun, iffun at der paa Hovedet sidder en mørk eller Jernfarvet Plet af Skikkelse som et Hierte, og paa Ryggen en Stræg af samme Farve, som strækker sig lige fra Hovedet til Stierten, er tagget paa begge Sider og har desuden en Rad sorte Pletter paa hver Side langs ned ad. Paa Kroppens Underdeel er Farven sorteblaa og glændsende, med adskillige Ansigtfarvede Pletter paa Siderne. Den underste Deel af Hovedet er ganske Ansigtfarve; og den øverste Kæbe har paa hver Side 8 hvide Stial eller Pletter. Denne Orm bliver altsaa efter mine Tanter en *Aspis Authorum*, som er rar i de Nordlige Lande; skiont det tillige er vist, at den rare Slange *Æsping*, som Linnæus beskriver i Schwed. Acad. Abhandl. 1749.

Translated as: The so-called “Guul-Fræning” is next to the “Bue-Orm” the most common; but must be described somewhat more elaborately. Its length is almost 1 “Alen” minus 2 crossfingers (approximately 60 cm), and the thickness is like that of an average finger. The head is flat, and the tail is quite pointed. In the mouth, there are rows of fine

teeth above and below, and in the upper jaw, there are 2 long and movable teeth shaped like cat’s claws. On the upper part of the body, the scales lie in several rows, 21 scales in each row, all elongated and marked with a raised line. Between the rows, there are 3 larger scales, and under the chin, there are 2 fairly large, but somewhat smaller scales. The abdominal scutes are 146 on one specimen, but 148 on the other; and the caudal scales are 34 on the first specimen, but only 30 on the second. The color on the upper part of the body is mostly reddish-brown, although there is a dark or iron-colored spot on the head shaped like a heart, and on the back, there is a line of the same color, which extends straight from the head to the tail, is jagged on both sides, and also has a row of black spots on each side along the way down. The color on the lower part of the body is blackish-blue and shiny, with several flesh-colored spots on the sides. The lower part of the head is entirely flesh-colored; and the upper jaw has 8 white spots or specks on each side. According to my observations, this snake is an “*Aspis Authorum*,” which is rare in the Northern countries; although it is also certain that it is the rare snake “*Æsping*,” which Linnæus describes in Schwed. Acad. Abhandl. 1749.

Strøm (1762 p. 193) concluded that the snake is “*Aspis Authorum*” which he claims is highly rare in the northern lands (presumably he referred to Northern parts of Europe). It perfectly resembles the rare snake “*æsping*” described by Lin-

naeus (1749a). It should be noted that Strøm's specimens exceed Linnaeus' in size by about three times. Exceptionally large *Vipera berus* specimens are known from Scandinavia, with the largest from Norway (Bringsøe et al. 2021). The description of the colour and the scale counts suggest that both of Strøm's specimens were adult female *Vipera berus*.

Carl Linnaeus described the common viper or adder, now designated *Vipera berus* (Linnaeus, 1758), as three different taxa, i.e. *Coluber Berus*, *Coluber Chersea*, and *Coluber Prester*. The Swedish vernacular name "äsping" was used for the small (juvenile) reddish adder, or as described by Linnaeus in (1749a) snakes of "dull red" color found in southern Sweden (Fig. 6). Figures 1 and 2 on Plate 6 found at the end of the October–December 1749 issue of *Kongl. Svenska Vetenskaps-Academiens Handlingar* depicts the Swedish snake Linnaeus described as "Äsping" (Linnaeus 1749a) see (Krešák 2006; Fig. 7).

Although not discussed in the book, we are aware that Strøm came to the above classification conclusion after careful assessment of the scale counts, as detailed in his annotations book (field observations journal) (Strøm and Strøm 2022).

Linnaeus classified snakes based on the number of ventral and subcaudal scales. While he recognized that these could vary between specimens of the same species, he still believed that the sum of these two scale counts was rather constant for a species and argued that small differences (in the paper referred to a difference of two scales) are a result of counting error (Linnaeus 1752). For further discussion on the Linnaean approach see Krešák and Wahlgren (2008) and for an English translation of "Anmärkning Om Ormarnas Skiljemärken" (Remark On Distinguishing-marks between Snakes (Linnaeus, 1752)) see Wahlgren (1999).

Strøm (Strøm and Strøm 2022) was uncertain about the correct classification of the snake with 148 ventrals and 30 subcaudals (sum 178) when using Linnaeus's scale number system. The snake resembled *Coluber ammodytes* (*Vipera ammodytes* Linnaeus 1758), but following Linnaeus's scale count rule, the best fit was the Asian *Coluber scutis abdominalibus CXVIII, caudalibus LXI* (Linnaeus 1749b) (= *Coluber domicella* Linnaeus 1758 [nomen dubium] with a total of 179 scales). Strøm's journal (Strøm and Strøm 2022) provides details on the collection of the snakes; the specimen with 148 ventrals and 30 subcaudals was collected in or prior to 1759, whereas the other specimen, the female listed in the twelfth edition of *Systema Naturae* as *Coluber Aspis*, was collected in 1760.

The above-mentioned letter from Strøm to Linnaeus and the multiple citations of the 1762 book in the twelfth edition of *Systema Naturae* (Linné 1766) suggest that Linnaeus



Fig. 6. The lectotype of *Coluber chersea* specimen NRM 5994 Angelstad, Småland, southern Sweden.

was well aware of the publication and its content. While the description by Strøm corresponded to Linnaeus' *Coluber Aspis*, the sum of the ventral and subcaudal scales of both specimens (in one 180, 178 in the other) were far below the ones Linnaeus counted (i.e., 192). In spite of the differences in scale counts, probably due to the very detailed matching phenotypic description, Linnaeus selected the specimen with the higher scale count and included it within his description of *Coluber Aspis*.

In later publications Strøm (1784, 1791) described Linnaeus's *Coluber chersea* from the Eiker region and argued that the key to differentiate the "Gull-fraening" or *Coluber aspis* from *Coluber chersea* are the multiple greyish spots of the ventrals and its large size (Strøm 1791).

Strøm's record on the occurrence of *Coluber aspis* in Norway was not only self-referenced and cited by Linné (1766) but by other contemporary zoologists as well, e.g., Müller (1776), Wille (1786).

FATE OF THE "COLUBER ASPIS" SPECIMEN

Nothing indicates that Linnaeus would have received the specimen from Strøm since no further correspondence between the two naturalists is known to exist, apart of the single letter referenced above (Schjødt 1871). According to Fanti (2019) the Strøm collection has been lost. Inquiries to the institutions below, considered as possible locations to which the Strøm specimen(s) might have been donated, have been unsuccessful. This supports the conclusion that the specimens of the Strøm collection have been lost and that his Norwegian Asp Vipers from Sunnmøre have survived solely on the pages of Hans Strøm's encyclopedia.

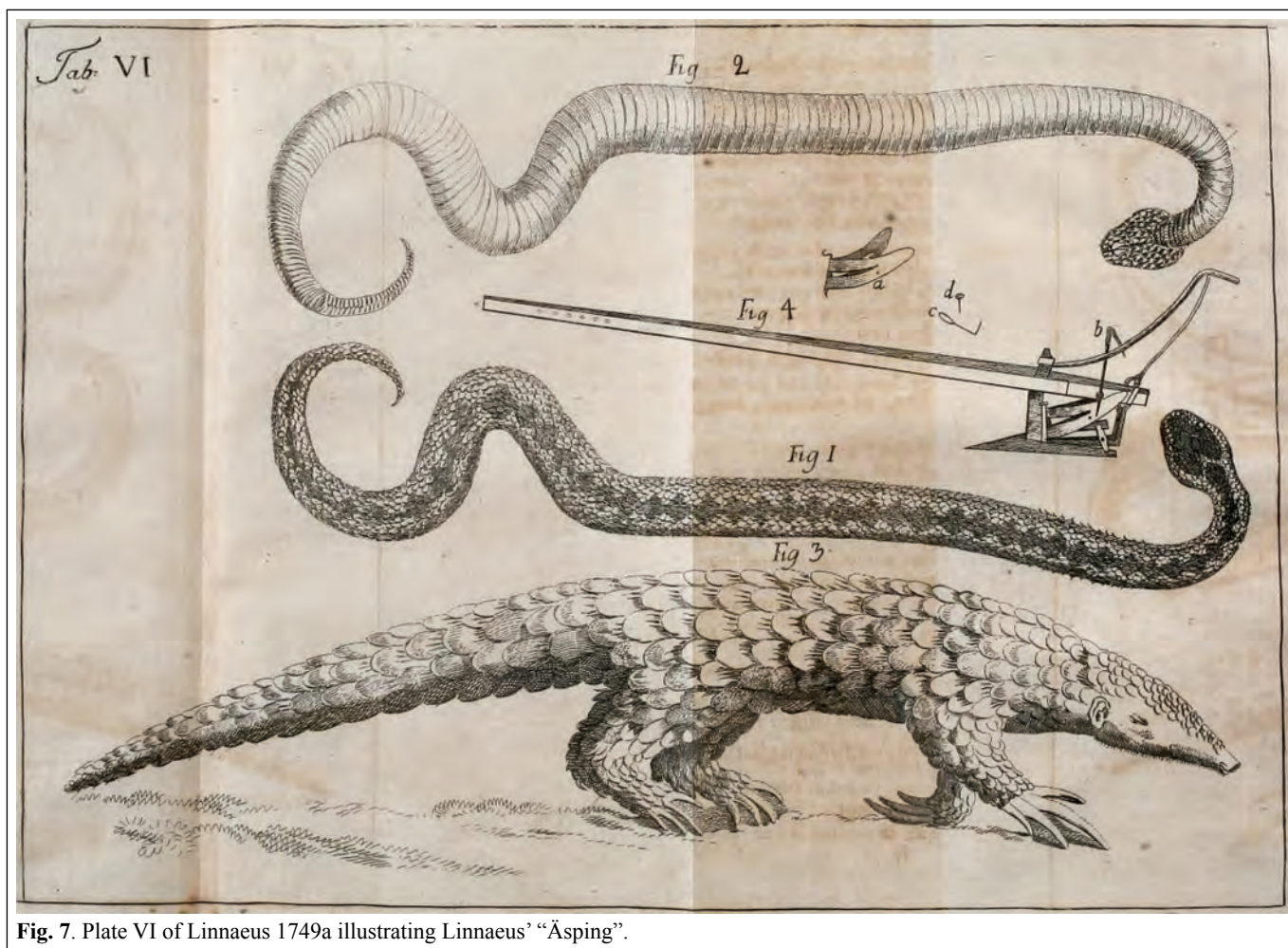


Fig. 7. Plate VI of Linnaeus 1749a illustrating Linnaeus' "Äsping".

Collections reviewed in search of the Strøm vipers included:
Norway: NTNU University Museum Trondheim; Natural History Museum, University of Oslo; University Museum of Bergen.

Denmark: Natural History Museum of Denmark, University of Copenhagen; Museum Vestsjælland.

Sweden: The Swedish Museum of Natural History, Stockholm; Museum of Evolution, Uppsala University.

ACKNOWLEDGEMENTS

Karstein Hårsaker, Thore Koppetsch, Bjørn R. Olsson, Dr. Mark D. Scherz, Annette Dinesen; Erik Åhländer, and Dr. Paco Cardenas are acknowledged for the feedback on the collections under their care. Dr. Elin Strøm kindly answered questions on Hans Strøm. The critiques and comments of Dr. Bo Stille, Prof. Aaron M. Bauer and Thore Koppetsch highly improved the text.

REFERENCES

- Amudsen, A.B. 2023. The rural spectator. Clergy as agents of Enlightenment in eighteenth-century Norway. Pp. 33–53. In: Ljunberg, J. and E. Sidenvall eds. *Religious Enlightenment in the eighteenth-century Nordic countries. Reason and orthodoxy*. Lund: Lund University Press.
- Apelseth, A. 1995. *Hans Strøm (1726–1797): ein kommentert bibliografi*. Volda: Høgskulen i Volda.
- Bringsøe, H., Ophus, K.H. and P. Sørensen. 2021. Very long northern vipers *Vipera berus* from Norway. *Herpetological Bulletin*, 156:45–46.
- Fanti, F. 2019. Some taxonomical notes on Cantharidae (Coleoptera). *Studies and Reports Taxonomical Series*, 15(1):27–39.
- Golay, P., Monney, J.-C., Conelli, A., Durand, T., Thiery, G., Zuffi, M.A.L. and S. Ursenbacher. 2008. Systematics of the Swiss asp vipers: some implications for the European *Vipera aspis* (Linnaeus, 1758) complex (Serpentes: Viperidae) — A tribute to Eugen Kramer. *Amphibia-Reptilia*, 29:71–83.
- Jørgensen, P.M. 2010. Hans Strøm – Norges første moderne biolog. *Naturen*, 134:218–227.
- Kitchell, K., and H.A. Dundee. 1994. Translation and annotation of the amphibian and reptile section of Systema Naturae X. In: Kitchell K Jr, Dundee HA, editors. *A trilogy on the herpetology of Linnaeus's Systema Naturae X*. *Herpetological Information Service*, (100):3–40.
- Krečsák, L. 2006. Copyright in the 18th century: Linnaean drawings of Coluber in Museum S:æ R:æ M:tis Adolphi Friderici Regis (1754) reproduced in Bonnaterre's Tableau encyclopédique et méthodique, Ophiologie (1790). *Bibliotheca Herpetologica*, 6(2): 21–27.

- Krečsák, L., and R. Wahlgren. 2008. A survey of the Linnaean type material of *Coluber berus*, *Coluber chersæa* and *Coluber prester* (Serpentes, Viperidae). *Journal of Natural History* 42(33-36):2343–2377.
- Linnaeus, C. 1749a. Äsping. till Kongl. Svenska Vetenskaps-Akademiens Handlingar, October, November, December: 246–251+Pl. VI.
- Linnaeus, C. 1749b. Amphibia Gyllenborgiana. Descripta a Barth. Rudolpho Hast... *Amoenitates Academicæ*, Upsaliae 1:107–140.
- Linnaeus, C. 1752. Anmärkning Om Ormarnas Skilje-märken. *Kongl. Svenska Vetenskaps-Akademiens Handlingar Stockholm*, 13:206–207.
- Linnaeus, C. 1758. *Systema Naturæ per regna tria naturæ, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis. Tomus I. Editio decima, reformata*. Holmiæ: Laurentii Salvii.
- Linné, C. 1766. *Systema Naturæ per Regna Tria Naturæ, Secundum Classes, Ordines, Genera, Species, cum Characteribus, Differentiis, Synonymis, Locis. Tomus I*. Holmiæ: Laurentii Salvii.
- Müller, O.F. 1776. *Zoologiæ Danicæ Prodromus, seu Animalium Danicæ et Norvegiæ Indigenarum Characteres, Nomina, et Synonyma Imprimis Popularum*. Havniæ: Typis Hallageriis.
- Pontoppidan, E. 1752. *Det første forsøg paa Norges Naturlige Historie, Førestillende Dette Kongeriges Luft, grund, Fielde, Vande, Væxter, Metaller, Mineralier, Steen-Arter, Dyr, Fugle, Fiske, og omsider Indbyggernes Naturrel, samt Sædvaner og Levemaade*. Kiøbenhavn, Trykt i de Berlingske Arvingers Bogtrykkerie, ved Ludolph Henrich Lillie.
- Pontoppidan, E. 1753. *Det første forsøg paa Norges Naturlige Historie, Førestillende Dette Kongeriges Luft, grund, Fielde, Vande, Væxter, Metaller, Mineralier, Steen-Arter, Dyr, Fugle, Fiske, og omsider Indbyggernes Naturrel, samt Sædvaner og Levemaade. Anden Deel*. Kiøbenhavn, Trykt i de Berlingske Arvingers Bogtrykkerie, ved Ludolph Henrich Lillie.
- Reeploeg, S. 2015. Northern Maps: Re-negotiating Space and Place in the Northern Isles and Norway in the Eighteenth Century. *Northern Scotland* 6(1):24–48.
- Schiødte, J.C. 1871. *Af Linnés brevvexling: aktstykker til naturstudiets historie i Danmark*. Kjøbenhavn: Thieles Bogtrykkeri.
- Strand, E. 1917. Der norwegische Naturforscher Hans Strøm (1726–1797) und seine zoologischen Schriften. Ein Blatt aus der Geschichte der norwegischen Zoologie. *Archiv für Naturgeschichte*, 83A(6):27–46.
- Strøm, H. 1762. *Physisk og Oeconomisk Beskrivelse over Fogderiet Søndmør, beligende i Bergens Stift i Norge. Oplyst med Landkort og Kobberstykker. Første part*. Trykt i Sorøe.
- Strøm, H. 1766. *Physisk og Oeconomisk Beskrivelse over Fogderiet Søndmør, beligende i Bergens Stift i Norge. Anden part*. Trykt i Sorøe.
- Strøm, H. 1784. *Physisk-Oeconomisk Beskrivelse over Eger-Præstegæld i Aggershuus-Stift i Norge; tilligemed et geographisk Kort over samme*. Kiøbenhavn: Trykt paa Gyldendals Forlag hos A. F. Stein.
- Strøm, H. 1791. Om en lidetbekiendt Norsk Slange, *Coluber chersæa* Linnæi. *Skrifter af Naturhistorie-Selskabet*, 1(2): 25–29.
- Strøm, E. and H. Strøm. 2022. *Annotations-Bog 1759–1780*. Transkribert av Elin Strøm. Oslo: Universitetet i Oslo. [Field journal of Hans Strøm transcribed and additionally analysed by Elin Strøm.]
- Wahlgren, R. 1999. Herpetology in the Transactions of The Royal Swedish Academy of Sciences. A listing of titles 1739–1825, translated into English, with annotations and unabridged translations of selected contributions and a brief history of the Academy. *International Society for the History and Bibliography of Herpetology*, 1(2):7–26.
- Walløe, L. 2024. *Hans Strøm in Norsk biografisk leksikon* på snl.no. Accessed January 21, 2024
- Wille, J.H. 1786. *Beskrivelse over Sillejords Præstegield i Øvre-Tellemarken i Norge, tilligemed et geographisk Chart over samme*. Kiøbenhavn: Trykt paa Gyldendals Forlag, hos Johan Rudolph Thiele.

We suggest the following format for citing this article:

Krečsák, L. 2024. Hans Strøm's Norwegian Asp Viper (*Coluber aspis*): a misdiagnosed 18th century *Vipera berus*. *Bibliotheca Herpetologica* 18(2):30–35.



Lacertulus minimus variegatus Plumier – a pre-Linnean description of a remarkable gecko (Gekkota: Sphaerodactylidae: *Sphaerodactylus*) from Haiti (Greater Antilles)

Herbert Rösler¹, Piotr Daszkiewicz², Ivan Ineich³ & Wolfgang Böhme⁴

¹Naturkundemuseum Erfurt, Große Arche 14, D-99084 Erfurt, Germany. Corresponding author, herbertroesler@aol.com

²Muséum national d'Histoire naturelle, PatriNat (OFB-MNHN-CNRS-IRD) Centre d'expertise et de données sur le patrimoine naturel, 36 rue Geoffroy Saint-Hilaire, CP 41 F-75005 Paris, France. piotr.daszkiewicz@mnhn.fr

³Muséum national d'Histoire naturelle, Institut de Systématique, Évolution, Biodiversité (ISYEB), CNRS, Sorbonne Université, École Pratique des Hautes Études-PSL, Université des Antilles, CP 30, 57 rue Cuvier, F-75005 Paris, France. ivan.ineich@mnhn.fr

⁴Leibniz Institute for the analysis of Biodiversity Change (LIB), Museum Koenig, Adenauerallee 127, D-53113 Bonn, Germany. w.boehme@leibniz-lib.de

Abstract. Charles Plumier, a priest of the Minims religious order, was a pioneer of botany in the West Indies at the end of the 17th century. He authored numerous zoological drawings and detailed descriptions, such as those on fish or crocodile anatomy. Many authors have subsequently used his manuscripts for their own publications and descriptions of new taxa. Among his botanical plates is a watercolor insert of a small lizard which he described and named *Lacertulus minimus variegatus* in a separate manuscript. Although coined prior to the adoption of the Linnean nomenclature, this nomen was used by subsequent authors and we determine its identification here. We conclude that this watercolor and the description later attached to it correspond to the endemic Haitian taxon *Sphaerodactylus elegans punctatissimus*. This means that the watercolor of *Lacertulus minimus variegatus* is probably the first pictorial representation of a species of this speciose genus.

INTRODUCTION

Among the few species collected and described from the Antilles in the second half of the 18th century is the geckolet *Sphaerodactylus sputator* (Sparman, 1784), the type species of the genus *Sphaerodactylus* Wagler, 1830. In the second volume of the important work “*Histoire naturelle, générale et particulière des reptiles*” by François-Marie Daudin (1776–1803) a variation of the specific name “*sputator*” is described as “*Anolis sputateur à vingt-deux ou vingt-trois bandes transversales noires*” [*Anolis sputateur* with twenty-two or twenty-three black transverse bands]. Daudin (1802) notes in describing this form: “J’ai trouvé la figure coloriée de cette seconde variété dans un manuscrit du père Plumier, déposé dans la bibliothèque du muséum d’histoire naturelle de Paris, ...” [I found the colored figure of this second variety in a manuscript of the father Plumier, deposited in the library of the Paris Natural History Museum, ...]. We followed this nomenclatural trail and found the collection “*Botanicum americanum, seu historia plantarum in americanis insulis nascentium*” by Charles Plumier (1646–1704), a French priest of the Catholic Minim order. The religious order of the Minims flourished in France in the 16th and 17th centuries but disappeared from the country after the French Revolution (Currier 1898, Oliger 1911). Plumier’s botanical work is considerable, including a multitude of new

taxa, forgotten because they predate Linnean taxonomy (e.g., see Colliard 1981). Plumier was among the first to propose naming the new genera he described in homage to notable botanists or naturalists-explorers. More than 50 patronyms for various plant species are known from him, for example, *Suriana* Linnaeus, 1753 (dedicated to his traveling fellow Joseph Donat Surian, 165?–1691, currently type genus of the family Surianaceae), and *Begonia* Linnaeus, 1753 (dedicated to Michel Bégon, 1638–1710, a French naval officer) (Stafleu and Cowan 1983, Stearn 1996). Although pre-Linnaean, numerous descriptions in his manuscripts served as a basis for valid descriptions by subsequent authors. Through a literature search, we found the gecko variety described by Daudin (1802) in Plumier’s unpublished “*Botanicum americanum*” (reference at Paris library, MNHN MS 4). Based on the original illustration in this collection of drawings, we identify this variety below.

HISTORICAL BACKGROUND

Plumier was a recognized craftsman, an illustrator, and an engraver in addition being an excellent botanist. He also made significant contributions to ichthyology and herpetology and his zoological manuscripts, including anatomical studies, were the basis for several recent publications on fish (Thireau *et al.* 2008, Pietsch 2017) and the American crocodile (*Cro-*

codylus acutus (Cuvier, 1807) (Pietsch 2022). Being an active naturalist, Plumier visited the New World three times, however, the dates of Plumier's various journeys are unclear (see Urban 1920, Hrodej 1997, Regourd 2000, Mottram 2002 and references cited therein). Fournier (1932) mentions three trips to America and writes that Plumier landed for the first time in the West Indies in 1689. He made this first trip with Joseph Donat Surian (see above), a physician of the King and also chemist, pharmacist, and botanist, from Marseille who initiated this trip and led the expedition. Hanomou (2008) is of the same opinion and gives the date of 1689, evoking a sojourn of 18 months for the first trip. He adds that Plumier made three voyages "entre 1689 et 1697, trois voyages à destination des colonies françaises d'Amérique : la Martinique, la Guadeloupe, Saint Domingue, faisant escale sur de nombreuses petites îles telles St Kitt, Ste Croix, St Christophe, St Eustache..." [between 1689 and 1697 to the French colonies of America: Martinique, Guadeloupe, Santo Domingo, stopping off on numerous small islands such as St. Kitts, St. Croix, St. Christophe, St. Eustache...]. However, Hrodej (1997), by carefully analyzing the royal administrative documents, as well as the Plumier manuscripts preserved at the MNHN library, is of the opinion that "The three journeys reported in the biographical dictionaries did not take place in 1689, 1693, and 1695, but in 1687, 1689, 1694" and emphasizes that the king's order for the first journey is dated 22 July, 1687. The uncertainties are significant. We think Plumier came across this tiny lizard and made a drawing of it in Haiti during his first trip in 1689–1690. It is, however, possible that this happened later, in 1693, when he visited Haiti a second time (Travel dates after Fournier 1932). Whenever it was, he drew the little, conspicuously coloured lizard and named it *Lacertulus minimus variegatus*.

Plumier signed many of his drawings, usually in the form "Fr. C. plumier minimus". "Fr." means "Frère" [brother], and "C." Charles. The genus *Sphaerodactylus* contains some of the smallest lizards in the world (e.g. *S. ariasae*, *S. parthenopion*, see Thomas 1965, Hedges and Thomas 2001) and we assume that the specific epithet *minimus* (Latin for small, tiny), that Plumier gives to the lizard, refers to a small size and the subordinate epithet *variegatus* refers to its dorsal stripe pattern. In a three-stage size-related context, Plumier also used the Latin terms *major* and *minor* as well as *minimus* to distinguish phenotypically similar fish species that are not really small (e.g. *Scomber maior*, *S. minor* and *S. minimus Americanus*, see Pietsch 2017). Regardless of this interpretation, it cannot be completely ruled out that Plumier's epithet *minimus* also refers to his religious order, the Minims. *Lacertulus* means "small lizard", and we suspect that he did not want to repeat that the lizard was small. It is therefore possible that Plumier did not use *minimus* to refer to the lizard's unusually small size, and that the fact that this adjective is homonymous with his religious order was not a coincidence.

Unfortunately, no conclusions about the date of origin of Plumier's engraved plant drawings can be drawn because in

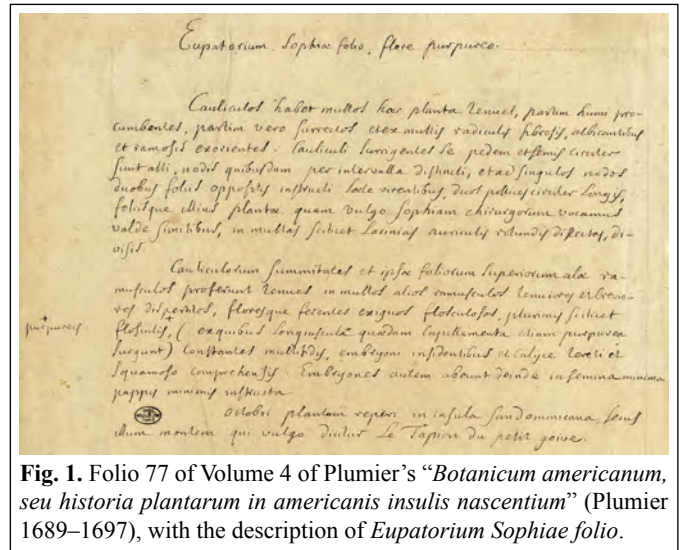


Fig. 1. Folio 77 of Volume 4 of Plumier's "*Botanicum americanum, seu historia plantarum in americanis insulis nascentium*" (Plumier 1689–1697), with the description of *Eupatorium Sophiae folio*.

the course of preparing the print templates all supplementary details of non-botanical data were removed (see the figures in Plumier 1693, 1703, 1705). The same is true for the botanical drawings by Plumier published by Burmanus (1755). Plumier's collection of specimens and herbarium were destroyed during a shipwreck, but Plumier safely took his manuscripts and drawings onto another ship and only those arrived safely in Europe. They are now hosted at the Muséum national d'Histoire naturelle in Paris (Boinet 1914).

The possible locality of *Lacertulus minimus variegatus* can be delimited a bit more precisely. In the "*Botanicum Americanum*", MNHN MS 4, Folio 77, is the description of the composite (Asteraceae Berchtold and Presl, 1820) *Eupatorium Sophiae folio* (Fig. 1), and in Folio 78 this plant is jointly figured with the lizard dealt with here (Fig. 2). Given that both the plant and the lizard most likely derive from the same place, then their common locality could be "Le Tapon du Petite", Haiti (cited in Plumier, Folio 77). Le Tapon du Petit Goâve is a hill located in the west of Haiti (18°25'60"N, 72°49'00"W). It is also accepted that Plumier never collected on the continent (Fournier 1932).

WHAT IS THE IDENTITY OF *LACERTULUS MINIMUS VARIEGATUS*?

There is hardly any doubt that *Lacertulus minimus variegatus* represents a species of the gekkotan genus *Sphaerodactylus* (Family Sphaerodactylidae Underwood, 1954). There are, however, no known specimens, and the Latin name is based only on a drawing (Plumier, *Botanicum americanum*, volume 4, Folio 78, Figure 66 [Fig. 3]). Irrespective of the inexact date of origin of the drawing as well as of a later description, the name Plumier coined remains nomenclaturally unavailable since it appeared prior to Linnaeus' (1758) binominal classification.

The first and most detailed description of Plumier's *Lacertulus minimus variegatus* was provided by Daudin (1802:



Fig. 2. Folio 78 of Volume 4 of Plumier's "*Botanicum americanum, seu historia plantarum in americanis insulis nascentium*" (Plumier 1689–1697), with the illustration of *Eupatorium Sophiae folio* (Ink drawing) and *Lacertulus minimus variegatus* (Watercolor, left lower corner).

103), based only on Plumier's watercolor as indicated. He connected, however, his diagnosis with a new systematic combination. In contrast to authors (e.g., Schneider (1792), Brongniart (1800) and Latreille (1801)) who treated *Lacerta sputator* Sparrman, 1784 as a gecko, Daudin (1802) assigned it to his newly erected genus *Anolis*. Here he distinguished between two forms (subspecies in current sense) of *Anolis sputator* Daudin, 1802: (1) "Première variété. *Anolis sputateur* à dix bandes transversales noirâtres" (= *Lacerta sputator* Sparrman, 1784: 164, "Le Sputateur" Lacépède, 1788: 132, *Gecko sputateur* Latreille, 1801: 56)" [First variety. *Anolis sputator* with ten blackish traverse bands (= *Lacerta sputator* Sparrman, 1784: 164, "Le Sputateur" Lacépède, 1788: 132, *Gecko sputateur* Latreille, 1801: 56)] and (2) "Deuxième variété. *Anolis sputateur* à vingt-deux ou vingt-trois bandes transversales noires" (= *Lacertulus minimus variegatus* Plumier: Fig. 66) [Second variety. *Anolis sputator* with twenty or twenty-

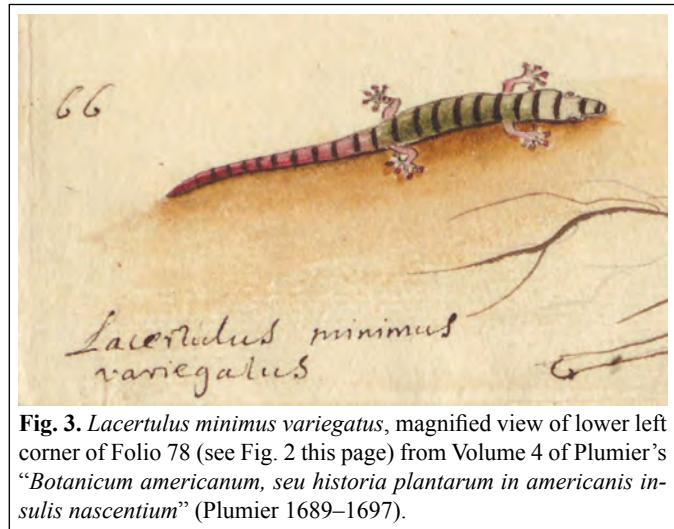


Fig. 3. *Lacertulus minimus variegatus*, magnified view of lower left corner of Folio 78 (see Fig. 2 this page) from Volume 4 of Plumier's "*Botanicum americanum, seu historia plantarum in americanis insulis nascentium*" (Plumier 1689–1697).

three black transverse bands (= *Lacertulus minimus variegatus* Plumier: Fig. 66)]. It is necessary to note, that Daudin's diagnosis of the name for the first variety almost certainly refers to plate 28 (top) in Lacépède (1788) (Fig. 4) and not to the description and plate 4 (Fig. 1) in Sparrmann (1784) (Fig. 5).

According to the sources given by Daudin (1802), viz. the descriptions and figures on plate 28 in Lacépède (1788) and on plate to page 56 in Latreille (1801), his first name refers to *Sphaerodactylus cinereus* Wagler, 1830, a view also shared by Graham and Schwartz (1978). These authors consider the specimen figured in the upper half on Lacépède's plate as a female, the lower one, on the same plate, as a male of *S. cinereus*.

Under the second trivial name, Daudin (1802) described the size and color pattern of *Lacertulus minimus variegatus*: "Cet animal a deux pouces quatre lignes de longueur totale; sa queue occupe la moitié de cette longueur; sa couleur est d'un gris verdâtre, plus pâle sur la tête, avec vingt-deux ou vingt-trois bandes transversales noires depuis les narines jusqu'au bout de la queue. Les pieds sont d'une couleur rose, ainsi que la queue" [This animal is two inches and four lines total length; its tail occupies half of this length; its color is a greenish-gray, paler on the head, with twenty-two or twenty-three black transverse bands from the nostrils to the end of the tail. The feet are a pink color, as is the tail].

Subsequently, only a brief mention from Daudin's opinion can be found in Duméril and Bibron (1836). They provided accounts for three *Sphaerodactylus* species, among them two newly named ones: *Sphaeriodactylus* [sic] *punctatissimus* (= *Sphaerodactylus elegans punctatissimus*), and *Sphaeriodactylus* [sic] *fantasticus* (= *Sphaerodactylus fantasticus*). For the description of *Sphaeriodactylus* [sic] *sputator* Cuvier, they used new material collected by Alexandre Ricord (1798–1876) from Saint Domingue (= Haiti). The species account of *Sphaeriodactylus* [sic] *sputator* in Duméril and Bibron (1836) ends with a comment which is partly based on data of other authors who provided synonymy lists for this species. To sum up, they said in this account that they would not only regard the two forms described by Daudin (1802)

as different from *S. sputator* as recognized by Sparrman (1784) and Lacépède (1788), but also *Lacertulus minimus variegatus* as variation at infraspecific level. Here, they must have overlooked the species erected by Wagler (1830), viz. *Sphaerodactylus cinereus*, as well as *Sphaeriodactylus* [sic] *elegans* described by MacLeay (1834). Neither name appears in their extensive synonymy of *S. sputator* nor in the synonymies of their other two species.

The last authors dealing with the taxon *Lacertulus minimus variegatus* are Cocteau and Bibron (1843a, b, 1855a, b) in their treatment of the reptiles of Cuba. Thier publication appeared as part 4 of the great encyclopedia on Cuba by Ramón Dionisio de la Sagra y Peris (also called Ramon de la Sagra, 1798–1871). The work was published bilingually, in Spanish and French editions. We used both editions and the corresponding publication dates digitized by the Biodiversity Heritage Library (BHL) (see also comments in literature). Smith and Grant (1958) publish an extensive analysis of both editions of Ramon de la Sagra's "*Historia natural de Cuba*" and summarize that the Spanish edition appeared before the French edition. In both editions, the descriptions and especially the synonymy lists of *Sphaeriodactylus* [sic] *sputator* and *Sphaeriodactylus* [sic] *cinereus* differ from each other due to different pagination, but not significantly in terms of content. Recognition of publication dates before 1843 does not require a change to the current nomenclature, as both *Sphaerodactylus* species that we consider here are unaffected. Generally, Cocteau and Bibron (1843a, b) follow Daudin (1802), but are of different opinion about his commonly criticized typological assignment (see below). They made an extensive literature research, and after having compared and evaluated numerous published descriptions, they mention or describe respectively two sphaerodactylid species from Cuba. The name *Lacertulus minimus variegatus* Plumier was assigned by them as the oldest synonym of *Sphaeriodactylus* [sic] *sputator* Sparrman. Further synonyms and chresonyms cited by them are non-latinized as well as binominal names from the publications of Lacépède (1788), Schneider (1792), Daudin (1802), Cuvier (1829), MacLeay (1834) and Duméril and Bibron (1836).

ON THE STATUS OF *LACERTULUS MINIMUS VARIEGATUS* PLUMIER

Due to the limited evidence regarding the status of *Lacertulus minimus variegatus*, an unequivocal species identification seems difficult. However, some insights are possible from



Fig. 4. Lacépède (1788) plate XXVIII "Le Sputateur", now considered as *Sphaerodactylus cinereus* — (top) female; (bottom) male.

which older opinions can be reconstructed and allow us to draw new taxonomic conclusions. For instance, the incorrect assignment to the Iguanidae (*sensu* Oppel, 1811) of *Lacerta sputator* Sparrman, 1784 by Daudin (1802) was soon recognized as wrong and accordingly criticized (see among others Cuvier 1816, Duméril and Bibron 1836, 1837, Cocteau and Bibron 1843a, b). Daudin (1802), however, recognized the relationship of *Lacertulus minimus variegatus* to the genus *Sphaerodactylus*, which proved to be correct.

French herpetologists (Daudin 1802, Duméril and Bibron 1836, Cocteau and Bibron 1843a, b) treated *Lacertulus minimus variegatus* either as a subspecies or as a synonym of various *Sphaerodactylus* species valid today. Finally the taxon is indirectly recognized by Fitzinger (1843) who listed both forms of Daudin as synonyms of "*Sphaerodactylus Sputator* Cuv."

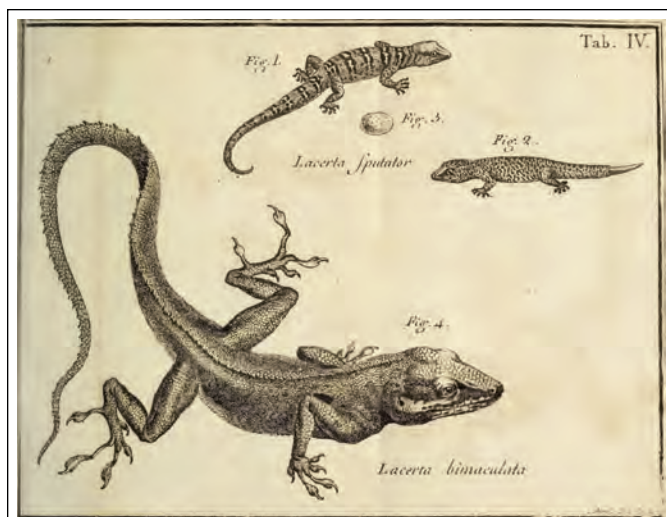


Fig. 5. Sparrman (1784) plate IV, in figure 1 “iconotype” of *Sphaerodactylus sputator*.

No preserved material exists of Plumier’s *Lacertulus minimus variegatus*, so only the drawing — a kind of “iconotype” representing the type — can be used for a taxonomic allocation. Moreover, the situation is complicated by the fact that its geographic origin, Haiti, is a diversity hotspot for *Sphaerodactylus* species (Schwartz and Henderson 1988, 1991, Powell *et al.* 1999, Powell 2012). A comparably high *Sphaerodactylus* diversity also applies to Cuba (Barbour 1921, Schettino *et al.* 2013)—including a suspected juvenile marking pattern in the *Lacertulus minimus variegatus* watercolor (see below). The situation is complicated by the fact, that sex- or age-related differences in color patterns are not known for all geckolets found in Haiti and Cuba. The possibility of *Lacertulus minimus variegatus* and *Sphaerodactylus sputator* (*sensu* Duméril and Bibron 1836 and Cocteau and Bibron 1843a, b) being conspecific can be dismissed. This hypothesis contradicts all current knowledge regarding the distribution of the numerous *Sphaerodactylus* species and subspecies in Haiti (Powell and Henderson 2012).

Most likely, the watercolor of *Lacertulus minimus variegatus* illustrates a subadult individual of a Haitian *Sphaerodactylus* species which has not yet changed into the adult color pattern or a female as depicted in Figure 4. It is possible that Plumier did not draw the gecko on the same scale as the associated plant, so that the measurements calculated by Daudin (1802) based on the watercolor are not necessarily correct. Due to the distinct color pattern of the lizard in the watercolor illustration, we suspect it is either *Sphaerodactylus cinereus* or *S. elegans*.

For a long time, it was assumed that *Sphaerodactylus cinereus* and *S. elegans* were members of one composite species (see among others Barbour 1921, 1923, Grant 1948, Duellman and Schwartz 1958, Wermuth 1965, Brygoo 1990 [in part]). Currently, both are regarded as distinct species (*sensu* Mittleman 1950). *Sphaerodactylus cinereus* is a species endemic to Hispaniola and includes—in addition to the

nominotypic form—the subspecies *S. c. stejnegeri* Cochran, 1931 (*vide* Graham and Schwartz 1978). *Sphaerodactylus elegans* likewise consists of two nominal taxa: *S. e. elegans* (MacLeay, 1834) and *S. e. punctatissimus* (Duméril and Bibron, 1836), the former being endemic to Cuba, the latter to Haiti (among others Schwartz and Garrido 1985, Powell *et al.* 1999, Hedges 2010). In order to resolve the status of *Lacertulus minimus variegatus*, our efforts focus on the three relevant Haitian *Sphaerodactylus* taxa, namely *S. c. cinereus*, *S. c. stejnegeri*, and *S. e. punctatissimus*.

Some of the characters described for the juveniles of both *S. cinereus* subspecies can indeed be found in Plumier’s watercolor, name a dorsally pattern of dark bands on body and tail as well as reddish to orange coloration of the limbs, including fingers and toes. However, a dark pattern on the upper side of the snout and similar markings on the occiput should be missing. Moreover, there are eleven black tail bands on the figure of *Lacertulus minimus variegatus*, while there are only three to four in the juveniles of *S. c. cinereus*.

A very good description of *Sphaerodactylus elegans* was provided by Grant (1948), and as mentioned above, Schwartz and Garrido (1985) distinguished between the Cuban and Haitian populations of *S. elegans* and regarded them as two subspecies each endemic to its island. Juvenile coloration of *S. e. elegans* has been documented in numerous illustrations (e.g. Cocteau and Bibron 1855a, b, Barbour and Ramsden 1919, Barbour 1921, Mittleman 1950, Behler and King 1979, Silva Lee 1982, Röhl 2006). We accept the current status of *S. e. punctatissimus sensu* Schwartz and Garrido (1985). Consequently, considering the geographic origin and the morphological characters, we regard the pre-Linnean name *Lacertulus minimus variegatus* to represent the endemic Haitian taxon *Sphaerodactylus elegans punctatissimus*.

Finally, we would like to point out that the pre-Linnean genus name *Lacertulus* was validated by the description of an extinct genus of lizard-like reptiles, possibly a lepidosauromorph, from the Karoo supergroup of South Africa. Carroll and Thompson (1982) described *Lacertulus bipes* as a single species of this genus, based on an almost complete skeleton. The type specimen (TM3/3602) is held at the Transvaal Museum in Pretoria.

CONCLUSION

In the framework of the early historical exploration of the lizard fauna of the Antilles, reference should be made to the publications by Bouton (1640), Du Tertre (1654, 1667a, b), Rochefort (1658) and Breton (1665). Of the lizards described in these publications, we were unable to identify any as a species of *Sphaerodactylus*, but Breuil (2002) refers to descriptions of geckos in Du Tertre (1654, 1667a, b), which presumably belong to the genera *Hemidactylus* and *Thecadactylus*. Furthermore, the herpetological documentation on the French overseas territories also contains no indication that a sphaerodactylid was known before 1689 (Massary *et al.*

2017, 2018, 2021, Dewynter *et al.* 2019). Sloane (1725: 334, pl. 273, Fig. 7.8) probably provides the earliest description and illustration of a *Sphaerodactylus* species. Sloane uses the name *Salamandra minima* and possibly it is a *Sphaerodactylus argus* Gosse, 1850. Thus, the lizard watercolor created by Plumier at the end of the 17th century is the earliest pictorial record of any *Sphaerodactylus* species. It can be added to the list of lizards which were discovered early but remained unnoticed for a long time.

ACKNOWLEDGEMENTS

For providing the illustrations from the “*Botanicum americanum, seu historia plantarum in americanis insulis nascentium*” in a high resolution formatting we should like to thank Hélène Foisil, and Alice Lemaire (Service Diffusion et médiation des savoirs, Direction des bibliothèques et de la Documentation, Muséum national d’Histoire naturelle, Paris). We thank our long-time friend and colleague Hinrich Kaiser (Victor Valley College, Victorville) for his support of our literature research. We are also grateful to Kraig Adler (Professor Emeritus, Cornell University, Ithaca), Aaron M. Bauer (Villanova University), and Theodore Wells Pietsch (Professor Emeritus, University of Washington) for their critical input, improving our work.

REFERENCES

- Barbour, T. 1921. *Sphaerodactylus*. *Memoirs of the Museum of Comparative Zoology*, 47(3):215–278.
- Barbour, T. 1923. West Indian investigations of 1922. *Occasional papers of the Museum of Zoology, University of Michigan*, 132:1–9.
- Barbour, T. and C.T. Ramsden. 1919. The herpetology of Cuba. *Memoirs of the Museum of Comparative Zoology*, 47:71–213.
- Behler, J.L. and F.W. King. 1979. *Field guide to North American reptiles and amphibians*. New York, Alfred A. Knopf, 718 p.
- Berchtold, B.W. and J.S. Presl. 1820. *O přirozenosti Rostlin, ob-sahující gednání o žiwobyti rostlin pro sebe a z ohledu giných žiwoků, podlé stawu nyněgssího znanj, pýtwu rostlin; názwoslowj audů; hospodárstwj gegich; rozssjřenj po zemi a způsob rostlinář zřjdiť a zachowati*. Praze, Krala Wiljma Endersa, 322 p.
- Boinet, A. 1909. *Catalogue général des manuscrits des bibliothèques publiques de France. Paris – Tome I^{er}. Mairie du XVI^e Arrondissement – École des Beaux-Arts, Faculté de Médecine – Académie de Médecine, École Supérieure de Pharmacie etc.* Paris, Librairie Plon, Plon-Noirrit et C^{ie}, Imprimeurs-Éditeurs, 606 pp.
- Bouton J. 1640. *Relation de l’establissement des François depuis l’an 1635 en l’isle de la Martinique, l’une des Antilles de l’Amérique*. Paris, Sébastien Cramoisy, i–vi, 141 p.
- Breton, R. 1665. *Dictionnaire caraïbe-françois. Meslé de quantité de Remarques historiques pour l’éclaircissement de la langue*. – Auxerre, Bocquet Gilles, 480 p.
- Breuil, M. 2002. *Histoire naturelle des Amphibiens et Reptiles terrestres de l’archipel Guadeloupéen. Guadeloupe, Saint-Martin, Saint-Barthélemy*. Paris, Publications Scientifiques du M.N.H.N., 339 p.
- Brongniart, A. 1800. *Essai d’une classification naturelle des reptiles, par le citoyen. II^e. Partie. Formation et disposition des genres. Bulletin des Sciences, par la Société Philomathique*, 2:89–91, 1 pl.
- Brygoo, É.-R. 1990. Les types de Gekkonidés (Reptiles, Sauriens) du Muséum national d’Histoire naturelle. *Catalogue critique. Bulletin du Muséum National d’Histoire Naturelle, Section A, Zoologie, Biologie et Écologie Animales*, 3–4, supplément:19–141.
- Burmanus, J. 1755. *Plantarum Americanarum fasciculus primus, Carolus Plumierius, botanicorum princeps detexit, eruitque, atque in Insulis Antillis ipse depinxit*. Amstelaedami, Viduam & Filium S. Schouten, 118 p., 127 pls.
- Carroll, R.L. and P. Thompson. 1982. A bipedal lizardlike reptile from the Karroo. *Journal of Paleontology*, 56(1):1–10.
- Cochran, D.M. 1931. A new lizard from Haiti (*Sphaerodactylus stenegeeri*). *Copeia*, 1931(3):89–91.
- Cocteau, T. and G. Bibron. 1843a. *Reptiles*. Pp. 1–142. in: R. De la Sagra (ed.) *Historica, fisica, politica y natural la Isla de Cuba. Segunda Parte, Historia Natural. Tomo IV. Reptiles y peces*. Paris, Maulde et Renou.
- [In the bibliography of his publications on Cuba, De la Sagra (1858) gives the publication date of 1837 for both parts (Primera parte.–Historia fisica y politica, Segunda parte.–Historia natural) of his work (Edición en folio, with láminas siguientes impresas en color y retocadas á mano). According to Trelles (1912), three of the 13 volumes were published between 1838 and 1839 (Tomo I., III., IV.), which agrees with the dates in Troschel (1839, 1841)]
- Cocteau, T. and G. Bibron. 1843b. *Reptiles*. Pp. i–xviii, 1–242. in: De la Sagra, R. (ed.) *Histoire, Physique, Politique et Naturelle de l’Ile de Cuba. Segunda Parte*. Paris, Arthus Bertrand.
- Cocteau, T. and G. Bibron. 1855a. *Reptiles*. Pl. 1–30. in: De la Sagra, R. (ed.) *Historica, fisica, politica y natural la Isla de Cuba. Segunda Parte, Historia Natural, Tomo VIII. Atlas de Zoologia*. Paris, Maulde et Renou.
- Cocteau, T. and G. Bibron. 1855b. *Reptiles*. Pl. 1–30. in: De la Sagra, R. (ed.) *Histoire, Physique, Politique et Naturelle de l’Ile de Cuba. Tomo VIII. Atlas de Zoologia*. Paris, Maulde et Renou.
- [The plates for reptiles are included in a folio atlas and identical in the Spanish and French editions. The earliest publication date of the atlas cannot be verified based on the information in De la Sagra (1858). Trelles (1912) gives 1855 as the publication date only for the “Atlas de Geologia” (= Atlas Geográfica) and “Atlas de Botánica”. Smith and Grant (1958) refer to significantly earlier publications of folios with reptiles. They argue that this was issued in 1840 or 1841, because Duméril and Bibron (1841) already cited exact references to plate numbers from the atlas to Cocteau and Bibron for some frog species.]
- Colliard, J. 1981. Un grand graveur méconnu, le Père Charles Plumier (1646–1704) et son *Traité des fougères de l’Amérique* (1705). *Bulletin du Bibliophile*, 1981-II:157–171.
- Currier, C.W. 1898. *History of religious orders. A compendious and popular sketch of the rise and progress of the principal monastic, canonical, military, mendicant and clerical orders and congregations of the eastern and western churches, together with a brief history of the catholic church in relation to religious orders*. New York (Murphy & McCarthy), i–x, 1–684.
- Cuvier, G. 1807. Sur les différentes espèces de crocodiles vivans et sur leurs caractères distinctifs. *Annales du Muséum d’histoire naturelle*, 10:8–86.
- Cuvier, G. 1816 [1817]. *Le Règne animal distribué d’après son organisation, pour servir de base à l’histoire naturelle des animaux*

- et d'introduction à l'anatomie comparée. Tome II. Les reptiles, les mollusques et les annélides. Paris, Déterville, i–xvii, 1–532.
- Cuvier, G. 1829. *Le Règne animal distribué d'après son organisation, pour servir de base à l'histoire naturelle des animaux et d'introduction à l'anatomie comparée*. Nouvelle édition, revue et augmentée. Tome II. Paris, Déterville, i–xv, 1–406.
- Daudin, F.M. AN X [1802]. *Histoire naturelle, générale et particulière des reptiles; Ouvrage faisant suite à l'Histoire naturelle générale et particulière composée par Leclerc de Buffon et rédigée de C. S. Sonnini*. Tome Quatrième. Paris, F. Dufart, 397 p., 16 pls.
- De la Sagra, R. 1858. *Conclusion de la Historia politica y natural de la isla de Cuba*. Paris (Renou y Maulade), 15 p.
- Dewynter, M., J.C. de Massary, C. Bochaton, R. Bour, I. Ineich, N. Vidal and J. Lescure. 2019. Liste taxinomique de l'herpétofaune dans l'outre-mer français: III. Collectivité territoriale de Martinique. *Bulletin de la Société Herpétologique de France*, 169:53–82.
- Duellman, W.E. and A. Schwartz. 1958. Amphibians and reptiles of southern Florida. *Bulletin of the Florida State Museum, Biological sciences*, 3(5):181–324.
- Duméril, A.M.C. and G. Bibron. 1836. *Erpétologie générale ou histoire naturelle complète des reptiles*. Tome Troisième. Contenant l'histoire de toutes les espèces des quatre premières familles de l'ordre des lézards ou sauriens, savoir: les crocodiles, les caméléons, les geckos et les varans. Paris, Librairie Encyclopédique de Roret, i–iv, 1–517.
- Duméril, A.M.C. and G. Bibron. 1837. *Erpétologie générale ou histoire naturelle complète des reptiles*. Tome Quatrième. Contenant l'histoire de quarante six genres et de cent quarante six espèces de la famille des iguaniens, de l'ordre des sauriens. Paris, Librairie Encyclopédique de Roret, i–xxiv, 1–571.
- Duméril, A.M.C. and G. Bibron 1841. *Erpétologie générale ou histoire naturelle complète des reptiles*. Tome Huitième. Comprehendant l'histoire générale des batraciens, et la description des cinquante-deux genres et des cent soixante-trois espèces des deux premiers sous-ordres: les péromèles qui n'ont pas de membres, et les anoures qui sont privés de la queue. Paris, Librairie Encyclopédique de Roret, i–iii, 1–784.
- Du Tertre, J.-B. 1654. *Histoire generale des isles de S. Christophe, de la Guadeloupe, de la Martinique, et autres dans l'Amérique où l'on verra l'établissement des colonies françoises, dans ces Isles; leurs guerres civiles & étrangères, & tout ce qui se passe dans les voyages & retours des Indes*. Paris, Jacques Langlois et Emmanuel Langlois, i–xviii, 1–492, 3 pls.
- Du Tertre, J.-B. 1667a. *Histoire generale des Antilles habitées par les François*. Tome I. Contenant tout ce qui s'est passé dans l'établissement des colonies françoises. Paris, Thomas Jolly, i–xxiv, 1–596, 6 pls.
- Du Tertre, J.-B. 1667b. *Histoire generale des Antilles habitées par les François*. Tome II. Contenant l'histoire naturelle. Paris, Thomas Jolly, i–xvi, 1–539, 4 pls.
- Fitzinger, L.I. 1843. *Systema Reptilium. Fasciculus Primus. Amblyglossae*. Vindobonae, Apud Braumüller and Seidel Bibliopolas, 106 p.
- Fournier, P. 1933 [1932]. *Voyages et découvertes scientifiques des missionnaires naturalistes français à travers le monde pendant cinq siècles – XVe à XXe siècles*. Paris, Paul Lechevalier & fils, 368 p.
- Gosse, P.H. 1850. Descriptions of a new genus and six new species of saurian reptiles. *Annals and Magazine of Natural History*, (2)6:344–348.
- Graham, E.G. and A. Schwartz. 1978. Status of the name *Sphaerodactylus cinereus* Wagler and variation in "*Sphaerodactylus stejnegeri*" Cochran. *Florida Scientist*, 41(4):243–251.
- Grant, C. 1948. Pattern changes in *Sphaerodactylus* and a comparison of Cuban and Haitian series of *S. cinereus*. *Journal of Entomology and Zoology*, 40(4):69–71.
- Hanomou, A. 2008. Les voyages du Père Charles Plumier (1646–1704): des dessins de la faune et de la flore des îles françaises d'Amérique (Martinique, Guadeloupe et Saint Domingue) à la fin du XVIIe siècle. *Bulletin d'histoire et d'épistémologie des sciences de la vie*, 15(1):51–71.
- Hedges, S.B. 2010. *Sphaerodactylus elegans* (Ashy Sphaero). Distribution. *Caribbean Herpetology*, 4:1.
- Hedges, S.B. and R. Thomas. 2001. At the lower size limit in amniote vertebrates: a new diminutive lizard from the West Indies. *Caribbean Journal of Science*, 37(3–4):168–173.
- Hrodej, P. 1997. Saint-Domingue en 1690. Les observations du Père Plumier, botaniste provençal. *Revue française d'histoire d'outre-mer*, 4:93–117.
- Lacépède, B.G.E.L. 1788. *Histoire Naturelle des quadrupèdes ovipares et des serpents*. Tome Premier. Paris, Hôtel de Thou, 651 p., 41 pls.
- Latreille, P.A. AN X [1801]. VIII^e Genre. Gecko, *Gecko*. Pp. 44–63, 307–309 in: Sonnini, C.S. and P.A. Latreille (eds): *Histoire Naturelle des Reptiles, avec figures dessinées d'après nature*. Tome II. Première Partie. Quadrupèdes et Bipèdes ovipares. Paris, Déterville, 332 p., 20 pls.
- Linnaeus, C. 1753. *Species plantarum, exhibentes plantas rite cognitatas, ad genera relates, cum differentiis specificis, nominibus trivialibus, synonymis selectis, secundum systema sexuale digestas*. Tomus I. Holmiae, Laurentii Salvii, 1–560.
- Linnaeus, C. 1758. *Systema naturae per regna tria naturae secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Volume I. Editio decima, reformata. Holmiae, Laurentii Salvii, 823 p.
- MacLeay, W.S. 1834. A few remarks tending to illustrate the natural history of two annulose genera, namely, *Urania* of Fabricius, and *Mygale* of Walkenäer. *Proceedings of the Zoological Society of London*, 1834:9–12.
- Massary, J.-C. de, R. Bour, M. Dewynter, I. Ineich, N. Vidal and J. Lescure. 2017. Liste taxinomique de l'herpétofaune dans l'outre-mer français: I. Collectivité de Saint-Martin. *Bulletin de la Société Herpétologique de France*, 164:37–54.
- Massary, J.-C. de, C. Bochaton, R. Bour, M. Dewynter, I. Ineich, N. Vidal and J. Lescure. 2018. Liste taxinomique de l'herpétofaune dans l'outre-mer français: II. Collectivité de Saint-Barthélemy. *Bulletin de la Société Herpétologique de France*, 166:59–78.
- Massary, J. C. de, C. Bochaton, M. Dewynter, T. Frétey, I. Ineich, O. Lorvelec, N. Vidal and J. Lescure. 2021. Liste taxinomique de l'herpétofaune dans l'outre-mer français : V. Département de la Guadeloupe. *Bulletin de la Société Herpétologique de France*, 178:6–23.
- Mittleman, M.B. 1950. Insular variation in the lizard *Sphaerodactylus cinereus*. *Herpetologica*, 6(3):60–66.
- Mottram, R. 2002. Charles Plumier, the King's Botanist – his life and work. With a facsimile of the original cactus plates and text from *Botanicon Americanum* (1689–1697). *Bradleya*, 20:79–120.
- Oliger, L. 1911. Minimi (or Minims). Pp. 325–326. In: Herbermann, C.G., Pace, E.A., Pallen, C.B., Shan, T.J. and Wynne, J. J. (eds.): *The Catholic Encyclopedia. Volume 10, Spezial Edition*. New York, Robert Appleton Company.

- Oppel, M. 1811. *Die Ordnungen, Familien und Gattungen der Reptilien als Prodom einer Naturgeschichte derselben*. München, Joseph Lindauer, i–xii, 1–86.
- Pietsch, T.W. 2017. *Charles Plumier (1646–1704) et ses dessins de poissons de France et des Antilles*. Paris, Publications scientifiques du Muséum, 408 p.
- Pietsch, T.W. 2022. Charles Plumier's anatomical drawings and description of the American crocodile, *Crocodylus acutus* (1694–1697). *Archives of Natural History*, 49(1):141–159.
- Plumier, C. 1689–1697. *Botanicum americanum, seu historia plantarum in americanis insulis nascentium, Authore P. Carolo Plumier ordinir Minimorum Provinciae Franciae ab anno 1689 usque ad annum 1697*. Tome 4. Paris, Bibliothèque du Muséum National d'Histoire Naturelle, Direction des Bibliothèques et de la Documentation, Document 15, Ms 4, 148 Folio.
- Plumier, C. 1693. *Description des plantes de l'Amérique avec leurs figures*. Paris, Imprimerie Royale, 94 p., 108 pls.
- Plumier, C. 1703. *Nova plantarum Americanarum genera*. 52 p. + 40 pls., et *Catalogus plantarum Americanarum*. 21 p. Paris, Joannem Boudot.
- Plumier, C. 1705. *Traité des fougères de l'Amérique*. Paris, Imprimerie Royale, i–xxii, 1–146, 170 pls.
- Powell, R. 2012. Hispaniola and Navassa. In: Powell, R. and R.W. Henderson (eds.): *Island lists of West Indian amphibians and reptiles*. *Bulletin of the Florida Museum of Natural History*, 51(2):129–136.
- Powell, R. and R.W. Henderson. (eds.) 2012. *Island lists of West Indian amphibians and reptiles*. *Bulletin of the Florida Museum of Natural History*, 51(2):85–166.
- Powell, R., J.A. Ottenwalder and S.J. Incháustegui. 1999. The Hispaniolan herpetofauna: diversity, endemism, and historical perspectives, with comments on Navassa Island. Pp. 93–168 in: Crother, B.I. (ed.): *Caribbean amphibians and reptiles*. San Diego, Academic Press.
- Regourd, F. 2000. *Sciences et colonisation sous l'Ancien Régime: le cas de la Guyane et des Antilles, XVIIe–XVIIIe siècles*. PhD thesis, Université Bordeaux III, 755 p.
- Rochefort C.D. 1658. *Histoire naturelle et morale des Antilles de l'Amérique. Histoire générale des Antilles habitées par les français. Livre Premier: Comprenant l'Histoire naturelle*. 1–263, 42 pls.; *Livre Second: Comprenant l'Histoire morale*, 264–527 + 12 p. Rotterdam, Arnould Leers.
- Röll, B. 2006. *Kugelfingergeckos, Sphaerodactylus elegans & Sphaerodactylus torrei*. Münster, Natur und Tier-Verlag GmbH, 62 p.
- Schettino, L.R., C.A. Mancina and V.R. González. 2013. Reptiles of Cuba: checklist and geographic distributions. *Smithsonian Herpetological Information Service*, 144:1–96.
- Schneider, J.G. 1792. *Amphibiorum Physiologiae specimen alterum, historiam et species generic Stellionum seu Geckonum sistens*. Typis Chr. Ludov. Frid. Apitzii, Commissum Iohanni Andr. Kunze, Traieti ad Viadrum, Frankfurt an der Oder, 54 p.
- Schwartz, A. and O.H. Garrido. 1985. The Cuban lizards of the genus *Sphaerodactylus* (Sauria: Gekkonidae). *Milwaukee Public Museum, Contributions in Biology and Geology*, 62:1–67.
- Schwartz, A. and R.W. Henderson. 1988. West Indian amphibians and reptiles: a check-list. *Milwaukee Public Museum Contributions in Biology and Geology*, 74:1–264.
- Schwartz, A. and R.W. Henderson. 1991. *Amphibians and reptiles of the West Indies. Descriptions, distributions, and natural history*. Gainesville, University of Florida Press, i–xvi, 1–720.
- Silva Lee, A. 1982. *Chipojos, bayoyas y camaleones*. Ciudad de la Habana, Editorial Científico-Ténica, 84 p.
- Sloane, H. 1725. *A Voyage to the Islands Madera, Barbados, Nieves, S. Christophers and Jamaica, with the Natural History of the Herbs and Trees, Four-footed Beasts, Fishes, Birds, Insects, Reptiles &c. of the Last of those Islands. Volume II*. London, printed for the author, i– xviii, 11 plates, 1–499, 274 pls.
- Smith, H.M. and C. Grant. 1958. The proper names for some Cuban snakes: an analysis of dates of publication of Ramon de la Sagra's *Historia Natural de Cuba*, and of Fitzinger's *Systema Reptilium*. *Herpetologica*, 14(4):215–222.
- Sparman, A. 1784. *Lacerta sputator* och *Lacerta bimaculata* två nya ödlor från America. *Kongliga Vetenskaps Academiens Nya Handlingar*, 5:164–167.
- Stafleu, F.A. and R.S. Cowan. 1983. *Taxonomic literature. A selective guide to botanical publications and collections with dates, commentaries and types. Volume IV: P–Sak*. Second edition, Utrecht, Bohn, Scheltema & Holkema, i–viii, 1–1081.
- Stearn, W.T. 1996. *Stearn's dictionary of plant names for gardeners*. London, Cassell, 363 p.
- Thireau, M., F.J. Meunier, M.-L. Bauchot, A. Hamonou-Mahieu and T.W. Pietsch. 2008. L'œuvre ichtyologique de Charles Plumier aux Antilles (1689–1695). In: *Explorations et voyages scientifiques de l'Antiquité à nos jours*. C. Demeulenaere-Douyère, Éditions du CNRS, Collection CTHS-Histoire, 34:47–56.
- Thomas, R. 1965. A new gecko from the Virgin Islands. *Quarterly Journal of the Florida Academy of Sciences*, 28:117–122.
- Trelles, C.M. 1912. *Bibliographia Cubana del siglo XIX. Tomo Segundo (1826–1840)*. Matanzas, Qutrós y Estrada, 336 p.
- Troschel, F.H. 1839. Bericht über die Leistungen im Gebiete der Zoologie während des Jahres 1838. XI. Amphibia. *Archiv für Naturgeschichte*, 5(2):386–395.
- Troschel, F.H. 1841. Bericht über die Leistungen in der Naturgeschichte der Amphibien während der beiden Jahre 1839 und 1840. *Archiv für Naturgeschichte*, 7(2):111–127.
- Underwood, G. 1954. On the classification and evolution of geckos. *Proceedings of the Zoological Society of London*, 124:469–492.
- Urban, I. 1920. Plumiers Leben und Schriften nebst einem Schlüssel zu seinen Blütenpflanzen. Pp 1–158 in: Fedde, F. (ed.): *Repertorium specierum novarum regni vegetabilis. Band V*. Dahlem, Verlag des Repertoriums.
- Wagler, J.G. 1830. *Natürliches System der Amphibien mit vorangegangener Classification der Säugethiere und Vögel*. München, J.G. Cotta'sche Buchhandlung, i–ix, 1–354, 2 pls.
- Wermuth, H. 1965. Liste der rezenten Amphibien und Reptilien. Gekkonidae, Pygopodidae, Xantusiidae. *Das Tierreich*, Berlin, 80:i–xxii, 1–246.

We suggest the following format for citing this article:

Rösler, H., P. Daszkiewicz, I. Ineich & W. Böhme 2024. *Lacertulus minimus variegatus* Plumier – a pre-Linnean description of a remarkable gecko (Gekkota: Sphaerodactylidae: *Sphaerodactylus*) from Haiti (Greater Antilles). *Bibliotheca Herpetologica* 18(3):36–43.



Hermon Carey Bumpus and the *Reptiles and Batrachians of Rhode Island*, with Comments on Other Herpetological Content in *Random Notes on Natural History*, 1884–1886

Christopher J. Bell¹ and Travis J. LaDuc²

¹Department of Earth and Planetary Sciences, The University of Texas at Austin, Austin, Texas 78712. cjbelle@jsg.utexas.edu

²Biodiversity Center, The University of Texas at Austin, Austin, Texas 78712. travieso@austin.utexas.edu

INTRODUCTION

Random Notes on Natural History was a short-lived serial publication that appeared in the late 1800s, persisted for a few years and was then discontinued. It was published by Southwick & Jencks¹ in Providence, Rhode Island as monthly issues in three volumes from January 1884 through December 1886.

The inaugural issue noted that the serial was “a pamphlet devoted to the distribution of useful knowledge concerning the various departments of zoology, mineralogy, and botany.” It also carried contributions dedicated to geology, methods in taxidermy, biographical notes on naturalists, and news of local and regional science societies. Issues in volume 1 were independently paginated. Volumes 2 and 3 were continuously paginated, with continuous Roman numerals used for covers and advertisement pages, and Arabic numerals for the primary journal content. Most issues were strictly limited to 12 pages in total length, including the front and back cover pages; the normal format was a cover page backed with advertisements, 7 to 8 pages of content, and the remaining pages (including the back cover) filled with advertisements. Issue 12 of each volume was longer, with additional pages for Table of Contents to the volume and an index to advertisements. Volume 1(12) carried an additional page of content and an extra page of advertisements; Volume 3(12) carried 11 pages of content, condensed the Table of Contents and Index to one page, and followed that with two pages of advertisements, for a total of 16 pages.²

Advertisements were an important aspect of the publication for the duration of its publication history (Barrow, 2000). Southwick openly noted this in the final issue when he wrote

“...there yet seems to me no special need for this publication except to advertise my business” (Southwick, 1886:89³).

Advertisements were tied mostly to selling natural history objects from the Natural History Store of Southwick and Jencks (e.g., bird skins, eggs, marine organisms, glass eyes, mammals, turtles), and to providing notice to their catalogues of specimens available for sale, including catalogues of birds, minerals, and shells (Southwick and Jencks, 1884:8; Fig. 1). They also carried advertisements for other businesses focused on natural history, and private ‘for sale’ and ‘wanted’ notices.

From the first issue, the editors were committed to publishing titles in serial installments. At least 12 of these were started, including (with first and last installments indicated parenthetically) *The Shell-bearing Mollusca of Rhode Island* (by Horace F. Carpenter, 1[1]–3[12]), *Conchological Check-list* (by J. Ritchie, Jr., 1[1]–2[5]), *Color of birds’ eyes* (by Anonymous, 1[1]–1[4], 2[3]; a commentary by E. J. Smith, 2[7]–2[10], and 2[12, attributed to “Dickey & Allen”]), *The roseate spoonbill in Florida rookeries* (by Anonymous, 1[3]–1[6]), *The Rodentia of Rhode Island* (by Anonymous, 1[7]–1[9], title changed to *Rodentia of Rhode Island* and attributed to ‘S,’ in 2[2]–2[8]), *Historical trees of Rhode Island* (by Anonymous; second and third parts attributed to J. H. B., *Providence Journal*, 1[9]–1[11]), *Reptiles and batrachians of Rhode Island* (by Hermon C. Bumpus, 1[10]–3[11]), *A collecting trip to Cape Cod* (by Anonymous, 2[4]–2[5]), *The native trees of Rhode Island* (by L. W. Russell, 2[4]–3[3], title changed to *The forest trees of Rhode Island*, 3[4]–3[5], title changed to *Native forest trees of Rhode Island*, 3[6]–3[12]—the series was not completed because the journal ceased publication), *Check-list of British fresh-water shells* (by J. Ritchie, Jr., 2[9]–2[10]), *Check-list of genus Clausilia* (by J. Ritchie, Jr., 3[2]–3[10]), and *Wild flowers of Warwick* (by ‘W. W. B.’ 3[8]–3[10]).

It was Hermon Bumpus’s series on the herpetology of Rhode Island that drew us to the journal. His was the earli-

¹ James M. Southwick and Fred T. Jencks. Volume 2(12) was Published by “Southwick & Jencks, (James M. Southwick, Successor)”. On p. 89 of that issue Jencks notes that as a result of losing his eyesight, he sold his interest to his partner.

² Additional exceptions to the general format were issues 1(4) and 1(5), each of which consisted of 16 pages, to accommodate extra advertisements and other content.

³ Ten years later Southwick closed the business and assumed the role of Curator of the Natural History Museum of Roger Williams Park in Providence, Rhode Island; see Anonymous 1904a.

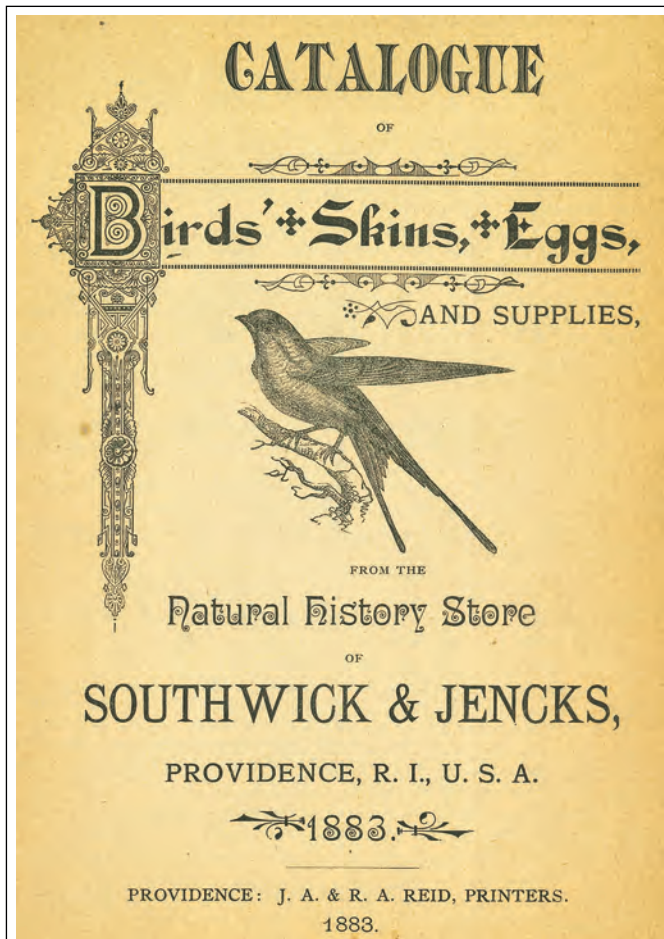


Fig. 1. Title page of an 1883 *Catalogue of Birds' Skins, Eggs and Supplies* from Southwick and Jencks Natural History Store in Providence, Rhode Island. Skins and/or eggs from an astounding 690 species of North American birds were offered for sale in this catalogue, along with smaller numbers of foreign bird skins and eggs, taxidermy mounts of birds and mammals, glass eyes, stands and shades, taxidermy instruments and tools, oology equipment, butterflies, moths, beetles, botanical mounting supplies, books, and checklists. It also included brief instructions on preparing birds skins and eggs. It is 48 pages long. From the Jack Wilson Archive at the Vertebrate Paleontology Collections, The University of Texas at Austin.

est attempted summary of the herpetofauna of that state and was the most important of the herpetological contributions published in *Random Notes on Natural History*. We provide a biographical sketch of Bumpus and his contributions to science and museology, an overview of his contribution to the herpetology of Rhode Island, and a brief notice of other herpetological content that appeared in *Random Notes on Natural History*.

HERMON CAREY BUMPUS

As an academic, administrator, and museologist, Hermon Bumpus made many contributions to advance science education and public understanding of science (Fig. 2). He operated largely behind the scenes—facilitating, enabling, and inspir-

ing others without seeking open recognition for his contributions. His priorities tended towards action and engagement, not to writing and publishing. As a consequence, he is not readily visible as an influential scientist of his day and is often overshadowed by those with whom he worked in close association through his career. His primary biographer was his son, who wrote of his father “He was always more concerned with doing a piece of scientific research than in preserving the results in print” (Bumpus, 1947:22) and “his restless energy found more satisfaction in doing things than in sitting at a desk with a pen in his hand. Moreover, he was always more interested in making it possible for others to record the results of their studies than in writing scientific papers himself” (Bumpus, 1947:45). Nonetheless, he produced a respectable corpus of published writings; we concentrate on his herpetological contributions and touch on a few others, but a full review of his publications is beyond the scope of this paper.

Biographers of Hermon Bumpus are few. Our notes are largely drawn from the book *Hermon Carey Bumpus. Yankee Naturalist* (Bumpus, 1947; Fig. 3) and are supplemented with additional data from a privately published pamphlet celebrating Bumpus’ presidency of and contributions to the Audubon Society of Rhode Island (Walter, 1943; Fig. 4), an obituary notice in *Science* (Mead, 1944), biographical notes in *Encyclopedia Brunoniana* (Mitchell, 1993), and a brief sketch in *Yosemite Nature Notes* (Russell, 1943). A short obituary published in *School and Society* (Anonymous, 1943) provided little more than dates of occupation in his various professional positions. The biography completed by his son (Bumpus, 1947) was started by A. D. Mead, who compiled most of the data included in the book (and also authored the obituary notice in *Science* in 1944), but did not complete the work. Herbert E. Walker worked with primary documents and took over the effort but also failed to complete it. The work was finally completed by his son and published in 1947.

Hermon Bumpus Sr. was a 9th generation descendent of Edouard Bon Passe, who arrived in Massachusetts from France in 1621. The family surname in Hermon’s day was a phonetic degeneration of the original French name. His parents, Laurin Aurelius Bumpus and Abbie Ann Eaton, were married in 1859 and Hermon was their first child, born on 5 May 1862.

He showed an early affinity for herpetological subjects. His childhood neighbors recalled his fondness for turtles and snakes. His siblings reported that “snakes were frequent inhabitants of his school desk”, an anecdote about a venomous snake that escaped in the family dining room (Bumpus, 1947:13), and at the age of ten he prepared (but was too shy to read aloud himself) an essay on frogs for his graduation from the Gibson School in Dorchester. His career aspirations in natural history were nearly cut short by a principal who, unimpressed with his academic performance, suggested that he might better become a grocer. Instead, he was coached in languages by that principal’s daughter so that he was able to pass the entrance examination to Brown University in 1879.

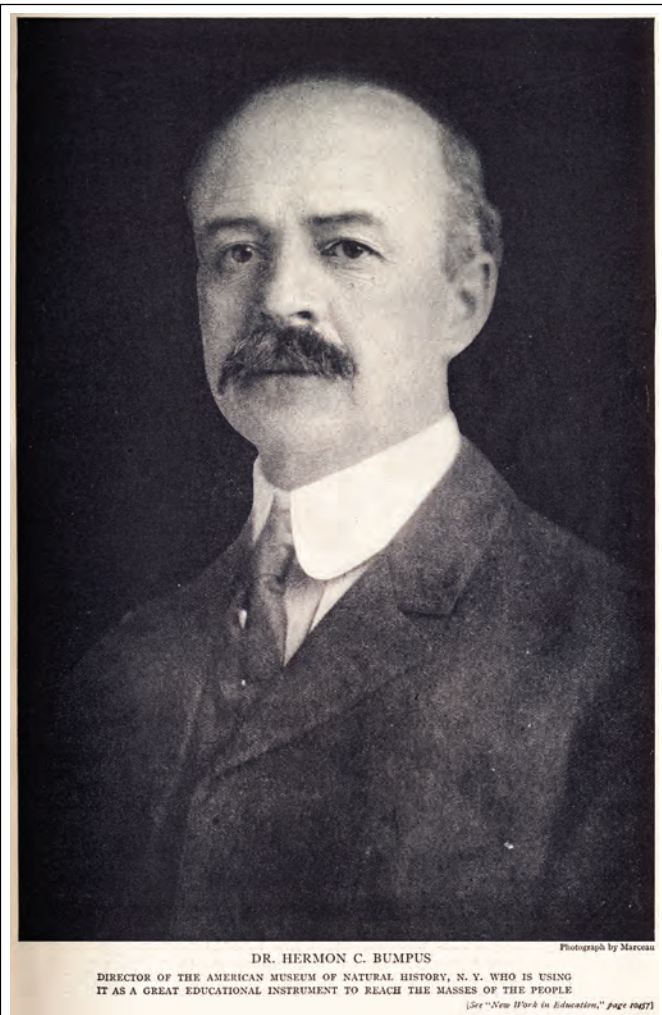


Fig. 2. Portrait of Hermon Carey Bumpus that appeared in volume 16 of *The World's Work* in 1908, page 10401. The caption recorded his efforts to emphasize education at the American Museum of Natural History. Those efforts strained his relationships with Henry Fairfield Osborn and some of the curators at the museum.

His attendance at Brown University was encouraged by a family friend, Professor John Whipple Potter Jenks (no relation to Fred T. Jencks) who had come to Brown to establish a museum (Wilson, 1968). Although Jenks maintained a religious faith in the tenets of special creation, Bumpus was drawn to the courses taught by Alphaeus Spring Packard, who was a leading Lamarckian biologist and a proponent of biological evolution. Bumpus nonetheless maintained an active engagement with Jenks and the museum and spent much of his time preparing and mounting specimens. In 1884, his senior year at Brown, Bumpus began publishing his serial *Reptiles and Batrachians of Rhode Island* (see below) and also authored the chapter on reptiles of the world for the encyclopedia *Standard Natural History* edited by J. S. Kingsley (Bumpus, 1885 [see also Bumpus, 1888]; the chapter on amphibians was written by E. D. Cope [1885]). He graduated in 1884 and was asked to take over Packard's classes while the latter was on leave. During that same year he helped to

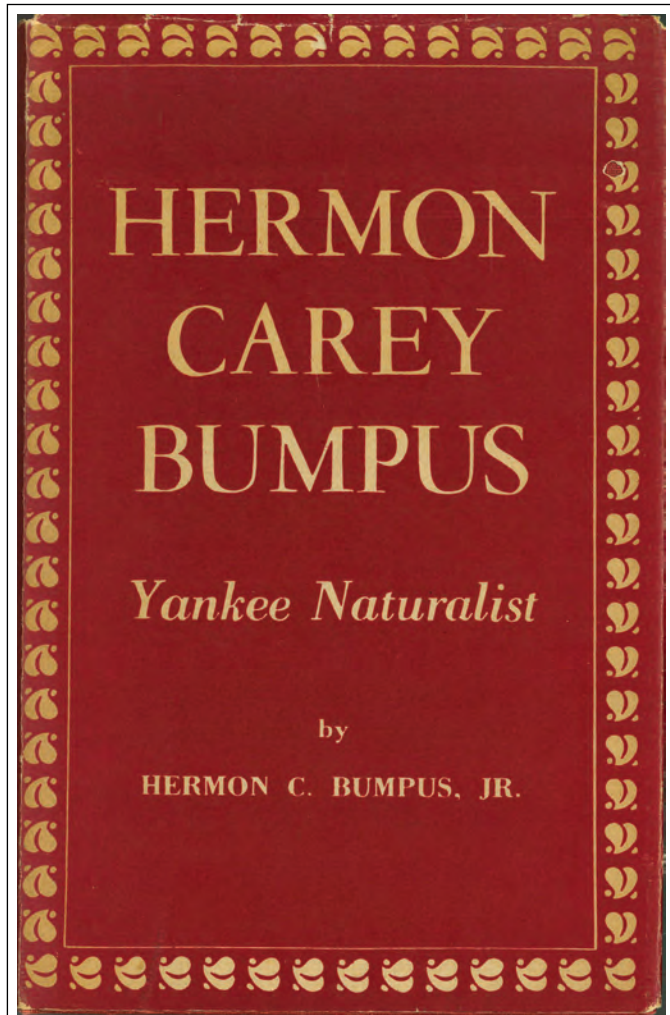


Fig. 3. The primary biography of Hermon C. Bumpus (Sr.) was crafted by three different compilers and authors and was finally completed by his son and namesake in 1947, a few years after his death.

prepare the Rhode Island exhibit for the Cotton Centennial in Louisiana, took the materials to New Orleans, and set up the exhibit there. His efforts there were acknowledged in the pages of *Random Notes on Natural History* (Anonymous, 1885).

In the autumn of 1886 Bumpus moved to Olivet College in Michigan (now the University of Olivet) and there took up the position of professor in the Department of Biology. At Olivet he embarked on a study of embryonic development of garter snakes but had difficulty obtaining an adequate sample of females. He published in the local newspaper an offer to pay 10 cents per live snake brought to him. Local children provided specimens, but only slowly. Then one man brought so many in one day that it strained Bumpus's finances to pay him. His work on the project was interrupted by expanding responsibilities and activities and he never published his data, but his carefully preserved materials were later reported by his son (Bumpus, 1947) to have served as the material component of at least one MS thesis at Brown University. We were unable to determine what thesis that might have been.

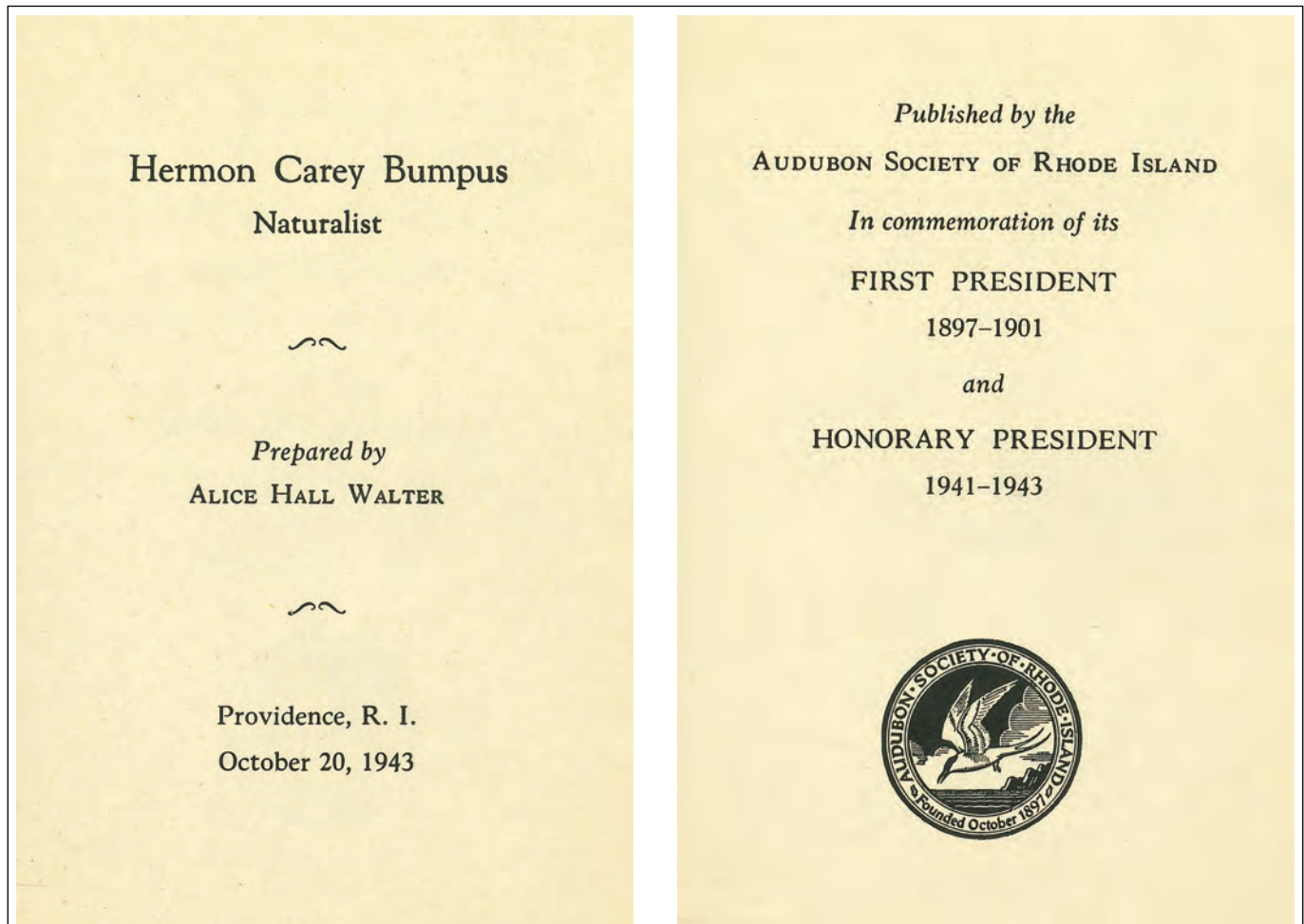


Fig. 4. Alice Walter's 1943 tribute to Hermon Bumpus is a 46-page pamphlet that highlighted his contributions to the Audubon Society of Rhode Island. It was inspired by a gathering of Bumpus's friends at the Kimball Bird Sanctuary in June of 1941, and was published in October 1943, four months after Bumpus's death. It is bound in a simple, blue, paperback cover bearing only the title. The title and dedication pages are depicted here.

While at Olivet he married his childhood sweetheart, Lucy Ella Nightingale. They remained there for only a few years before moving in 1889 to Massachusetts, where Bumpus worked to complete a PhD at Clark University in Worcester. He had previously spent two years pursuing graduate work at Brown University, so one additional year at Clark was sufficient to complete a dissertation on the American lobster, and his 1891 PhD was the first granted by Clark University.

Shortly after arriving in Massachusetts in 1889, he began work at the Marine Biological Laboratory at Woods Hole, where he established a summer training program for students in careers in biology and was made Assistant Director of the Laboratory (some years later he would accept the position of Director of the U.S. Bureau of Fisheries laboratory at Woods Hole). In 1890 Bumpus returned to Brown University as an Assistant Professor in zoology and Assistant Curator of the museum there (Wilson, 1968). In 1892 he advanced to Professor of comparative anatomy and was charged with establishing graduate studies and research in the biology department. His first student (and later biographer) was Albert

Davis Mead, who went on to succeed Bumpus in the department and then to become Vice President of the university.

Bumpus's early students noted and appreciated that he treated them as rising professionals, on an essentially even footing as himself; he made great efforts to expand their training through what we now call experiential learning, in the process forging unique opportunities for them. His efforts expanded to undergraduate education as well, again with experiential learning and research as key components of the curriculum. His educational philosophy was such that "From the beginning the policy had been to rely upon objective instruction and reduce talking to a minimum, to let students see, touch, and even smell, rather than passively listen to someone lecture on how nature behaved" (Bumpus, 1947:51). Bumpus himself laid out his philosophy on experiential learning in zoology (Bumpus, 1895), and re-emphasized certain points in a short essay in 1908 (Bumpus, 1908).

Bumpus did not dedicate much of his time to writing, and his research output is relatively small. He did, however, recognize when opportunity knocked. A severe storm in Febru-

ELEVENTH LECTURE.

THE ELIMINATION OF THE UNFIT AS ILLUSTRATED BY THE INTRODUCED SPARROW,
PASSER DOMESTICUS.

(A FOURTH CONTRIBUTION TO THE STUDY OF VARIATION)

HERMON C. BUMPUS.

WE are so in the habit of referring carelessly to the process of natural selection, and of invoking its aid whenever some pet theory seems a little feeble, that we forget we are really using a hypothesis that still remains unproved, and that specific examples of the destruction of animals of known physical disability are very infrequent. Even if the theory of natural selection were as firmly established as Newton's theory of the attraction of gravity, scientific method would still require frequent examination of its claims, and scientific honesty should welcome such examination and insist on its thoroughness.

A possible instance of the operation of natural selection, through the process of the elimination of the unfit, was brought to our notice on February 1 of the present year (1898), when, after an uncommonly severe storm of snow, rain, and sleet, a number of English sparrows were brought to the Anatomical Laboratory of Brown University. Seventy-two of these birds revived; sixty-four perished; and it is the purpose of this lecture to show that the birds which perished, perished not through accident, but because they were physically disqualified, and that the birds which survived, survived because they possessed certain physical characters. These characters enabled them to withstand the intensity of this particular phase of selective elimination, and distinguish them from

209

Fig. 5. The title page to Bumpus's published study of 136 injured English sparrows that had been caught in a storm and were found on the campus grounds at Brown University (Bumpus, 1899). This paper was Bumpus's most enduring and widely recognized publication (Google Scholar indicates 347 citations; compared to only four total citations for *Reptiles and Batrachians of Rhode Island*).

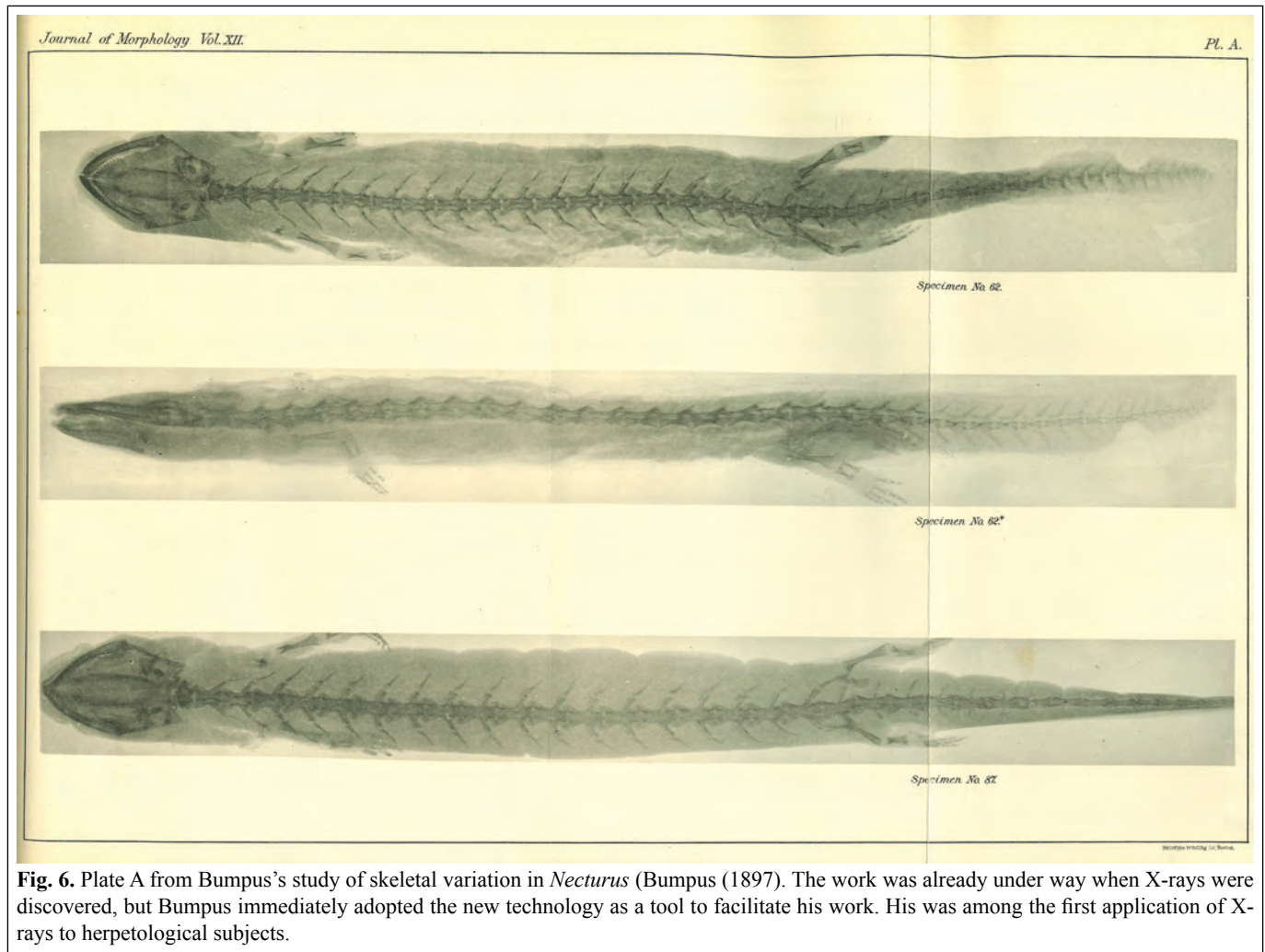
ary 1898 provided Bumpus a special opportunity; after the storm he discovered 136 disabled English sparrows on the campus grounds at Brown. These formed the material component of a study on variation and natural selection (Bumpus, 1899), for which Bumpus remains widely recognized (Fig. 5; see Harris, 1911; Johnston et al., 1972; O'Donald, 1973; Buttemer, 1992). It is almost certainly his most heavily cited work, garnering 347 citations according to Google Scholar at the time of this publication. Another of his published works is of historic interest for herpetologists because he was among the first to use X-rays to study skeletal morphology in salamanders. In the summer of 1896 he immersed himself in an ongoing study of the skeletal system of the salamander *Necturus*. He had already begun the work when Röntgen's discovery of X-rays was reported in 1895. Bumpus immediately ordered a Crookes Tube and applied X-rays to his study of al-

cohol-preserved *Necturus*. The work was not published until February, 1897 (Bumpus, 1897), but was certainly among the earliest uses of X-rays to study the skeleton of herpetological subjects (Breck Bartholomew, pers. comm., October, 2023; Fig. 6). Bumpus gave many lectures and demonstrations of the use of X-rays and is credited with being the first person in Rhode Island to use X-rays in human surgery (used to identify and facilitate removal of a pin from a foot). Somewhat surprisingly, he avoided the burns and injuries often suffered by others who were early pioneers of this technology.

In late 1900 Morris K. Jesup, then president of the Board of the American Museum of Natural History, hired Bumpus as his assistant and Curator of Invertebrate Zoology. Bumpus succeeded Henry Fairfield Osborn as Assistant to the President, and assumed his new position on January 1, 1901 (Anonymous, 1901). Jesup was impressed with Bumpus and gradually gave him greater responsibilities at the museum. After his first year there, Bumpus was appointed as the first Director of the American Museum. His responsibilities included oversight of administrative and scientific work of the museum, routine operation of the museum, its growth and expansion through alterations and new construction, the annual budget, and data pertaining to the disbursement of public monies. He was responsible for the field expeditions of the museum as well as its scientific publications, and had oversight for installation and maintenance of exhibits, as well as the responsibility to maintain scientific staff adequate for the museum's activities. Bumpus firmly believed in the museum as an educational institution with a unique role to play in facilitating public appreciation and understanding of science. In his mind and approach, that role was a priority that trumped the research mission of the museum; Bumpus designed a bookplate for the museum (Fig. 7) that reflected his personal view and read 'For the People For Education For Science.'⁴

That placed him at odds with Henry Osborn, then Second Vice-President of the museum, who preferred to emphasize the research mission of the museum. Soon after he arrived at the museum, Bumpus exemplified his priorities when he posted a public invitation to the children in New York schools to visit the museum to listen to a nature talk on a particular day. When the day came, thousands showed up—way more than could be seated in the public lecture hall. Bumpus promptly repurposed the entire museum staff and sent them into exhibit halls around the museum to host groups of the visitors and engage them with impromptu lectures. The experience demonstrated the need for a new department of educa-

⁴ The same motto was printed on the back cover of at least some of the museum Guide Leaflet Series from at least as early as 1921 (Matthew and Chubb, 1921, *Evolution of the Horse* [it did not appear on the 1913 edition of that title]) through at least the fourth edition of Lucas's *The Hall of Dinosaurs* (1933), but was removed from the fifth edition of Lucas's guide in 1939. Beginning in April 1908 (issue 4 of Volume 8) it was also printed on the back cover of most issues of *The American Museum Journal* (predecessor to *Natural History*); its last appearance was on the back cover of issue 4 of volume 18 (April 1918).



tion at the museum so he established one. During his time at the American Museum (1900 to 1910) Bumpus worked closely with curators and staff to develop programs and exhibits that would promote the museum's role in education. Although he delivered at least one public lecture ('How to study the reptiles' — Anonymous, 1904b), he mostly orchestrated the talents of curators and others for public education programs. When it came to his attention that museum staff had given lectures to the blind, Bumpus pioneered special hands-on exhibitions for visually impaired visitors (Vaughan, 1914; Anonymous, 1914a), initially through a dedicated space, and later by a program through which instructors would escort those visitors into exhibit halls and collection spaces to handle specimens. He also developed a 'circulating nature library' of natural history specimens that were loaned to school teachers to help them meet requirements of an unfunded mandate to develop a curriculum in Nature Studies in New York. It started in 1904 with ten traveling cabinets and 50 specimens and within two years had expanded to include 400 cabinets and thousands of specimens (Langdon, 1906).

Bumpus played an important role in the establishment of the American Association of Museums and became its first

president in May 1906, which brought additional recognition to the American Museum. He also played an important role in the conceptual development of the habitat group exhibits (especially of birds) that helped make the museum exhibits famous (Langdon, 1906). Ornithologist Frank M. Chapman wrote that the exhibit case designs were "devised by Dr. Hermon C. Bumpus, then Director of the Museum, and my enthusiastic coöperator in the introduction of new methods of exhibition" (Chapman, 1933:166). Bumpus also launched the career of Roy Chapman Andrews, famous explorer, naturalist, and later Director of the American Museum. Bumpus hired Andrews to work as a janitor, but recognized a latent talent and soon moved him into the taxidermy lab, appointed him an assistant on a project to help construct a model whale (Andrews, 1929a, b) and later sent him off to collect a whale skeleton and encouraged him to work on whales for a Master's degree at Columbia University (Bumpus, 1947; Rexer and Klein, 1995:64).

In his early years at the museum Bumpus worked with Morris Jesup and Henry Osborn to launch *The American Museum Journal* (predecessor to *Natural History*) as a popular-press publication of the museum (Rainger, 1991), but his ea-

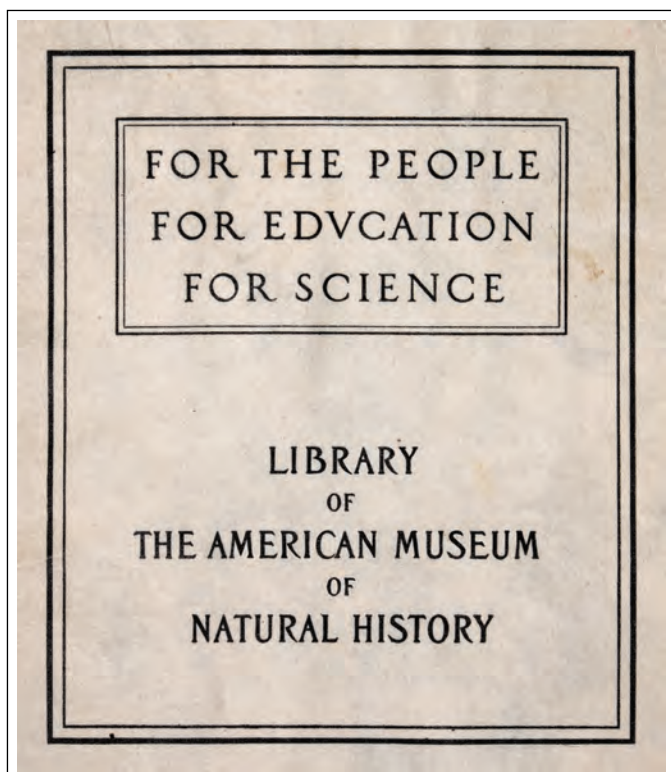


Fig. 7. Bookplate for the American Museum of Natural History, reflecting Hermon Bumpus's priorities for the museum mission. A cancellation stamp ('A.M.N.H. CANCELLED') was digitally removed for this image to restore its original appearance.

gerness to use the museum to bring natural history to the public through exhibits and education programs, and to emphasize those as priorities above research programs, brought Bumpus into conflict with some curators and the Board of Directors (Bumpus, 1947; Preston, 1986; Rainger, 1991; Rexer and Klein, 1995). After Jesup's death early in 1908, Osborn was appointed President of the Museum, and the Board moved to limit the powers of the Director (Bumpus, 1947). Ultimately Bumpus clashed directly with Henry Osborn when, in his responsibility for oversight of disbursement of public monies, he accused Osborn of financial improprieties and sought to have him fired as president (Rainger, 1991). Osborn worked to manipulate members of the Board of Directors in a move to have Bumpus dismissed in 1910 (Osborn also later had additional conflicts with Frederic A. Lucas, Bumpus's successor as Director; Rainger 1991:74). Many years later, Bumpus was vindicated when a 1942 management review of the American Museum finally documented that "not only had Osborn's program received special financial and administrative favors but also Osborn had tapped into the Jesup and Morgan funds in ways that were not completely legitimate" (Rainger, 1991:245).

The uncomfortable circumstances surrounding his departure from the American Museum left Bumpus somewhat despondent. His son noted that Bumpus "felt that his ideas about popular education had been repudiated and that he had lost the respect of men of science because of the imagined

failure of his museum work" (Bumpus 1947:71). Consequently, his next career move was a singular departure from his previous commitments. He accepted the newly-created position of Business Manager at the University of Wisconsin, and served in that capacity from 1911 through 1914. Then Bumpus was elected as President of Tufts College in September 1914 and started there on the first of January 1915 (Anonymous, 1914b). The first world war had already erupted in Europe, and a few months after his arrival at Tufts the sinking of the *Lusitania* raised the possibility that the United States would be drawn into the war despite President Woodrow Wilson's resistance to the development of a 'peace-time' standing army. The National Defense Act of 1916 was an important step in increasing military preparedness, but following the development in early 1918 by the War Department of the Student Army Training Corps (SATC), Bumpus organized the program at Tufts in the early summer of that year. Within a few months, the Armistice was signed and the war ended. Bumpus's time at Tufts was, thus, bracketed by preparing the College to move into war conditions and addressing the demobilization of the Student Army Training Corps. He resigned as President of Tufts at the end of 1918 (Anonymous, 1918a).

After retiring from academia Bumpus continued to work with the American Association of Museums, serving as Chair of the Committee of Outdoor Education, and addressing his efforts and attention to organizing educational programs in the National Parks. He developed the idea of the 'Trailside Museum,' and piloted the program in Yosemite National Park (Russell, 1943). The novel idea of these was that the 'exhibit' was the park itself—the museum building was the place park visitors could seek information and a broader context for what they were experiencing and witnessing in the park. Bumpus also wrote (anonymously; Bumpus, 1947:108) a series of *Trailside Notes* for Yellowstone and Grand Canyon National Parks (e.g. Bumpus, 1933, 1936; Fig. 8).

Increasingly complicated heart problems forced his work with the national parks and other scientific societies to come to an end in October 1940. This was consistent with his idea that "each new generation should solve its problems unencumbered by the ideas of either the aged or the dead" (Bumpus 1947:122). Hermon C. Bumpus Sr. died 21 June 1943 at his son's home in Pasadena, California. Vilhjalmur Stefansson named Mount Bumpus in the Canadian Arctic after him (Bumpus, 1947:66) and Bumpus Butte in Yellowstone National Park is a reminder of his dedicated service to the National Parks. Two full-page portraits of Bumpus were published by *The World's Work*—one in 1906 (volume 12, page 7694; his name was incorrectly given as "E. C. Bumpus") and the other in 1908 (volume 16, page 10401; see Fig. 2).

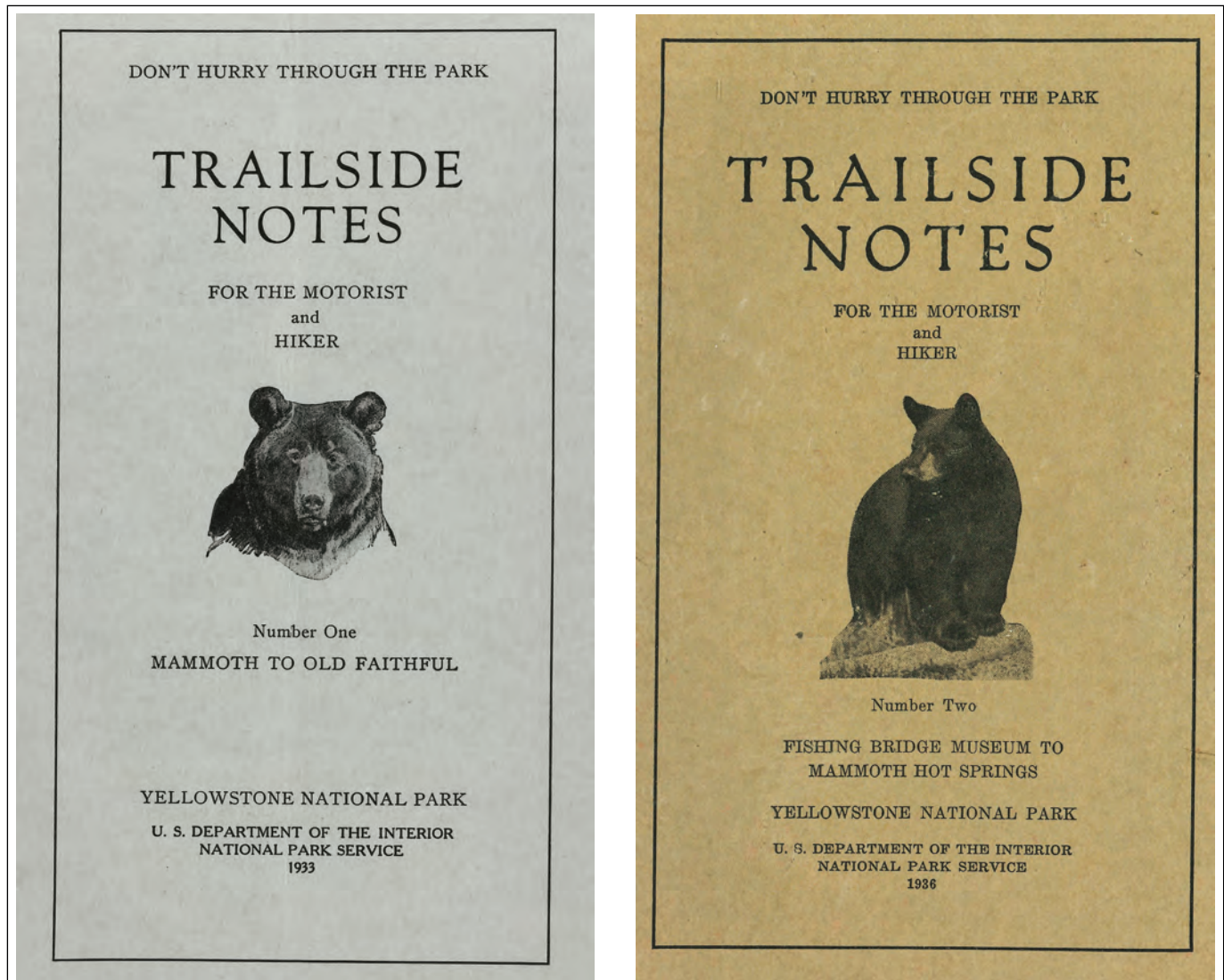


Fig. 8. Covers of the 1933 edition of *Trailside Notes Number 1* and the 1936 edition of *Trailside Notes Number 2* for Yellowstone National Park. These booklets were anonymously authored by Hermon Bumpus and were issued in “innumerable printings” (Bumpus, 1947:108).

***REPTILES AND BATRACHIANS OF RHODE ISLAND* (1884–1886)**

The first of 24 installments of *Reptiles and Batrachians of Rhode Island* was published in October of 1884 in the tenth issue of volume 1 of *Random Notes on Natural History* (Fig. 9). The last installment appeared in volume 3, number 11 in November, 1886. Installments appeared sequentially in successive issues but no installment appeared in issues 3(4) and 3(8). Each installment was quite short—either one or two pages in length. The first was an introduction to the project, the next eight addressed reptiles, and the last 15 were dedicated to the amphibians. The work was cited (in the aggregate) by Raithel (2019), who noted that Bumpus provided a reasonable listing of amphibian species found in the state, but that much of the data he presented were derived from observations or specimens from adjoining states, and that many of his observations were anecdotal. Bumpus’ work was not cited by

Drowne (1905) nor by the author[s] of the [Roger Williams] Park Museum Bulletin issues (Anonymous, 1918b, c, d, e⁵).

A complete citation to each installment is provided below, with a brief annotation of contents and taxa discussed.

⁵ There is no obvious author identified on the Park Museum Bulletins in question. Authorship was attributed to Marie E. Gaudette by Moriarty and Bauer (2000). Gaudette was the Curator and then Director of the Park Museum in the 1910s and 1920s (John Moriarty, pers. comm., 2024) and the initials M.E.G. appear in the lower right corner of the issue on snakes (Anonymous, 1918c), strongly suggesting that at least that issue was authored by Gaudette. A set of the Park Museum Bulletins in Aaron Bauer’s library includes several issues that have a typed notation “by Harold L. Madison” at the top of the first page. Those were sourced as duplicates from the Smithsonian Institution library and were part of Jim Peters’ collection. The source of the annotations is not indicated. Harold Lester Madison was director of the Roger Williams Park Museum in the early 1900s, and later director of the Cleveland Museum of Natural History; see Banks (1997) and a 1909 letter (attributed to him as director of the museum) on biodiversity heritage library at <https://www.biodiversitylibrary.org/partpdf/275334>.

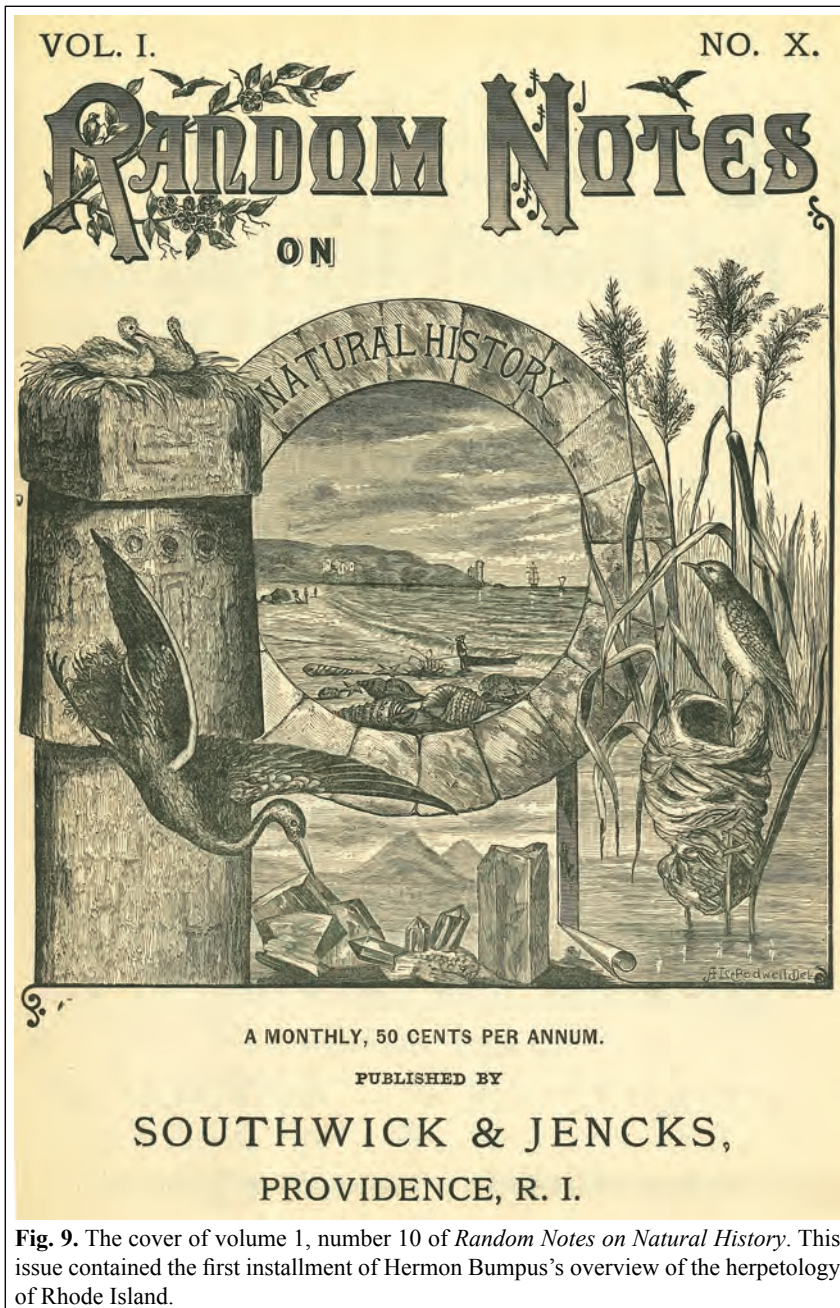


Fig. 9. The cover of volume 1, number 10 of *Random Notes on Natural History*. This issue contained the first installment of Hermon Bumpus's overview of the herpetology of Rhode Island.

Current taxonomic names are provided for all taxa for which Bumpus used older names or new combinations.⁶

Bumpus, H. C. 1884. Reptiles and Batrachians of Rhode Island. *Random Notes on Natural History* 1(10):4–5. [This installment is a general introduction to the series, including a call for readers to contribute data and specimens, a notice that remarkable specimens will be deposited in the Museum of Brown University, and an introduction to the reptiles. Bumpus observed that “our Reptiles and Batrachians are daily becoming fewer” (p. 4) and claimed that “In members of both classes intelligence is of an extremely low order” (p.5). He also stated that “[In snakes] the

⁶ We retained the use of *Bufo* and *Rana* for North American anurans based on the work of Pauly et al. (2009) and Yuan et al., (2016).

sense of smell is probably well developed, judging from the strong odor given off by many species during the breeding season” (p. 5)].

Bumpus, H. C. 1884. Reptiles and Batrachians of Rhode Island. Number II. *Random Notes on Natural History* 1(11):6–7. [Taxa discussed include *Sphargis coriacea* (= *Dermochelys coriacea*), *Thalassochelys caretta* (= *Caretta caretta*), *Chelonia mydas*, and *Chelydra serpentina*. Bumpus noted the egg-laying behavior of *Chelydra* is different from all other local turtles, in that it is “satisfied with nothing but sand” (p. 7) in which to lay its eggs. He acknowledged that no specimens of sea turtles had yet been taken from Rhode Island waters or coasts, but noted specimens of *Sphargis* and *Thalassochelys* were taken at Woods Holl (= Woods Hole; see Anonymous, 1899; Jessup, 1952) in Massachusetts. A specimen of *Dermochelys* from near Newport was reported by Drowne (1905), who also listed *Chelonia mydas* and *Caretta caretta* as being recorded from Rhode Island. *Dermochelys coriacea*, *Caretta caretta*, *Chelonia mydas*, and *Leidochelys kempi* all were noted to be present, but the latter three rarely seen, in waters off the coast of Rhode Island (Blake and Raitzel, 1983). There are now ten records of *Dermochelys* and one record of *Lepidochelys kempi* from Rhode Island waters on iNaturalist; the VertNet database records one specimen of *Dermochelys* from Rhode Island deposited at the Yale Peabody Museum, and one specimen of *Caretta* housed at the United States National Museum, Smithsonian Institution in Washington, D.C.].

Bumpus, H. C. 1884. Reptiles and Batrachians of Rhode Island. Number III. *Random Notes on Natural History* 1(12):6–7. [Taxa discussed include *Aromochelys odorata* (= *Sternotherus odoratus*), *Malacoclemmys palustris* (= *Malaclemmys terrapin*), *Chrysemys picta*, and *Chelopus guttatus* (= *Clemmys guttata*). Bumpus repeated a comment by J. A. Allen (1868:176) that *Chrysemys picta* is the species “whose shrill, piping note is heard, especially on rainy days, during May and June” (Bumpus, p. 6), but we are unaware of any other reports of such vocalizations in this species. Bumpus's unusual use of *Chelopus guttatus* followed use of that combination by Garman (1892: 215). In the last paragraph of this installment, Bumpus ‘corrected’ a statement he made in the first installment that the shape of the plastron in turtles was sexually dimorphic: “The concavity or convexity of the plastron is no indication of the sex” (p. 7). Plastron morphology is sexually dimorphic in some turtles discussed by Bumpus (e.g., *Terrapene carolina*; Powell et al., 2016)].

Bumpus, H. C. 1884. Reptiles and Batrachians of Rhode Island. Number IV. *Random Notes on Natural History* 2(1):5. [Taxa discussed include *Chelopus insculptus* (= *Glyptemys insculpta*), *Emys meleagris* (= *Emydoidea blandingii*), and *Cistudo carolina*

(= *Terrapene carolina*). Bumpus correctly noted that *Terrapene carolina* feed on ‘toad-stools and mushrooms, but his syntax erroneously suggests that that is their sole source of food. He recorded a box turtle from Middleboro, Massachusetts that survived five generations of the family since the first person carved his name on the plastron in the latter part of the previous century. He erroneously stated that *Terrapene* die if put in water].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number V. Random Notes on Natural History 2(2):13. [This installment provided an introduction to lizards. Taxa discussed include *Eumeces fasciatus* (= *Plestiodon fasciatus*) and *Sceloporus undulatus*. Bumpus noted that neither species was recorded in Rhode Island and stated “If our museums and collectors would turn their energy towards working up the natural history of their own localities, rather than with making fragmentary displays of exotic faunae, their results would be of much more practical value.” The first lizard from Rhode Island was recorded only in 2020, an individual of *Plestiodon fasciatus* found in South County (McLeish, 2020), however, no voucher specimen of a native lizard has yet been collected from Rhode Island].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number VI. Random Notes on Natural History 2(3):20–21. [This installation provided an introduction to snakes, with a key to genera. The key is of historical interest because the taxonomy of many groups is now different].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number VII. Random Notes on Natural History 2(4):28. [Taxa discussed include *Crotalus horridus*, *Ancistrodon* {sic} *contortrix* (= *Agkistrodon contortrix*). In the introductory comments to this installment, the name *Tropidenotus* {sic} is used: “Having, by aid of the plan given in the number, determined the *genus*, the reduction to *species*, when we have several species together under a single genus, as is the case with *Tropidenotus*, is, for Rhode Islanders, a comparatively simple operation.” In discussing rattlesnakes he stated “Though the sting of *Crotalus* may be extremely painful, it should never prove fatal if properly attended to...drinking large quantities of spirits, are said to generally check the serious effects of any ordinary attack...the snake seeming to realize that its supply of poison is not unlimited and if once exhausted it will be compelled to remain harmless until the glands have secreted enough to again fill the reservoirs.” Bumpus also dismissed the myth that age of the snake is equal to the number of segments of the rattle. Early historical records were reviewed by Raithel (2021) and he noted they were consistent with Bumpus’s comments. Three localities of *Crotalus horridus* from Rhode Island were reported by Drowne (1905). In the 1983 HerpWatch report, Blake and Raithel noted that the last known specimen of *Crotalus horridus* in the state was shot by a police officer in August 1966; there are no records of the species in Rhode Island on VertNet or on iNaturalist and the species is now considered extirpated from the state (Raithel, 2021)].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number VIII. Random Notes on Natural History 2(5):37–38. [Taxa discussed include *Ophibolus doliiatus triangulus* (= *Lampropeltis triangulum*), *Diadophis punctatus*, *Cyclophis vernalis* (= *Opheodrys vernalis*), *Elaphis guttatus vulpinus* (= *Pantherophis vulpinus*), and *Coluber constrictor*. Bumpus also mentioned *Elaphis alleghaniensis* and noted that neither rat snake was re-

corded from Rhode Island, but that they were known from Massachusetts. The source of his data for the presence of *Elaphis guttatus vulpinus* in Massachusetts is unknown; in the U.S., that species has yet to be recorded in New York, let alone areas to the east of there. He noted the ontogenetic change in dorsal pattern of *Coluber*, and that *Diadophis* and *Opheodrys* often were captured as pets].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number IX. Random Notes on Natural History 2(6):44–45. [Taxa discussed include *Tropidonotus saurita* (= *Thamnophis saurita*), *Tropidonotus sirtatis* (*Thamnophis sirtalis*), *Tropidonotus sipedon* (= *Nerodia sipedon*), *Storeria occipitomaculata*, *Storeria dekayi*, and *Heterodon platyrhinus* (= *Heterodon platirrhinos*). Blake and Raithel (1983) recognized only two valid records of *Storeria occipitomaculata* from Rhode Island. There are now 19 records of that species on VertNet; 18 at the American Museum of Natural History, and one at the Museum of Comparative Zoology. There are four records from Rhode Island on iNaturalist].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number X. Random Notes on Natural History 2(7):52–53. [This installment provided an introduction to Batrachia; taxa discussed were *Bufo americanus* and *Scaphiopus holbrookii*. Of the latter taxon, Bumpus remarked that its presence was presumed, but he had not heard of them being found in Rhode Island, noting that the appearance of some populations of *Scaphiopus holbrookii* in the region was “only periodical,” with multiple years sometimes separating sightings. The presence in Rhode Island of that species was documented by Drowne (1905) who noted a single specimen was present in the collection of the Roger Williams Park Museum. Further documentation was provided by Raithel and Calhoun (1981) and its presence in Rhode Island is now supported by voucher specimens deposited at the American Museum of Natural History. It was noted to be ‘rare/unusual’ by Raithel (2001). Specimen records and an updated distribution map were provided by Raithel (2019)].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number XI. Random Notes on Natural History 2(8):59–60. [The only taxon discussed was *Hyla versicolor*. He noted site fidelity for one individual found at a single tree for months and that a member of this species “... makes an interesting, though noisy pet”].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number XII. Random Notes on Natural History 2(9):68–69. [The only taxon discussed was *Hyla pickeringii* (= *Pseudacris crucifer*). Bumpus noted it was among the first to appear in spring and the last to “retire in the fall;” he noted predation on tadpoles by the spider *Dolomedes sexpunctatus* (now *Dolomedes triton*)].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number XIII. Random Notes on Natural History 2(10):75. [The only taxon discussed was *Rana sylvatica*. Bumpus noted that the species could be found early in March and that it was “...probable that the eggs were well matured before hibernation begins”].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number XIV. Random Notes on Natural History 2(11):83–84. [The primary species discussed was *Rana catesbeiana* (= *Rana catesbeiana*). Comparisons were made with the green frog (*Rana*

clamitans). Bumpus quoted J. A. Allen (with no citation or reference) that the diet of the bullfrog included *Chrysemys picta* (see Allen, 1868:195). He also noted that the geographic distribution of *Rana catesbeiana* extended from Quebec to California. The reference to occurrence in California is interesting because it places the species in that state nearly 30 years prior to the earliest occurrences (1914 to 1916) mentioned by Storer (1922), who later concluded that there were at least three separate introductions of the species into California, but the earliest incidence he reported was only as early as 1910 (Storer, 1925)].

Bumpus, H. C. 1885. Reptiles and Batrachians of Rhode Island. Number XV. Random Notes on Natural History 2(12):93. [The only species discussed was *Rana clamitans*. Bumpus listed owls and night herons as predators].

Bumpus, H. C. 1886. Reptiles and Batrachians of Rhode Island. Number XVI. Random Notes on Natural History 3(1):7–8. [The primary species discussed was *Rana palustris*; comparisons with *Rana halecina* (= *Rana pipiens*) were presented. *Rana palustris* was noted to be the most abundant frog in Rhode Island].

Bumpus, H. C. 1886. Reptiles and Batrachians of Rhode Island. Number XVII. Random Notes on Natural History 3(2):13. [The only species discussed was *Rana halecina* (= *Rana pipiens*). It was called the shad frog because it appeared in the Delaware River at the same time as the shad; Bumpus noted the relatively late breeding by this species].

Bumpus, H. C. 1886. Reptiles and Batrachians of Rhode Island. Number XVIII. Random Notes on Natural History 3(3):21. [This installment carried an introduction to Urodela and a discussion of *Diemyctylus miniatus* (= *Notophthalmus viridescens*). Bumpus noted the seasonal high tail crest and bright colors of the males, coincident with the breeding season].

[There was no installment in vol. 3(4)].

Bumpus, H. C. 1886. Reptiles and Batrachians of Rhode Island. Number XIX. Random Notes on Natural History 3(5):35. [The only species discussed was *Plethodon cinereus erythronotus* (= *Plethodon cinereus*). Bumpus mentioned the one-to-one relationship between costal grooves (“folds”) and vertebrae, tail breakage and regrowth, and that the eggs are suspended in cavities of logs like grape clusters. He made no mention of direct development in the egg].

Bumpus, H. C. 1886. Reptiles and Batrachians of Rhode Island. Number XX. Random Notes on Natural History 3(6):43. [The only species discussed was *Plethodon glutinosus*. There are no *Plethodon glutinosus* in Rhode Island (Raithel, 2019); there is one record in iNaturalist from western Connecticut. Bumpus mentions a specimen from Andover, Massachusetts, but *Plethodon glutinosus* is known from Massachusetts based only on a single dried larval specimen housed at the Museum of Comparative Zoology. There were essentially no data associated with the specimen; it lacked any specific collection data beyond the state, and the specimen record on VertNet indicates that the specimen is now destroyed].

Bumpus, H. C. 1886. Reptiles and Batrachians of Rhode Island. Number XXI. Random Notes on Natural History 3(7):52. [The only species discussed was *Amblystoma punctatum* (= *Ambys-*

toma maculatum); Bumpus discussed glands that secrete a milky fluid, ostensibly to help provide moisture, but in reality these are defensive secretions from the paired parotid glands behind the head (Scott, 2005)].

[There was no installment in vol. 3(8)].

Bumpus, H. C. 1886. Reptiles and Batrachians of Rhode Island. Number XXII. Random Notes on Natural History 3(9):69. [The species discussed were *Amblystoma opacum* (= *Ambystoma opacum*) and *Amblystoma tigrinum* (= *Ambystoma tigrinum*). Bumpus noted that the latter may be present in Rhode Island (it is not [Raithel, 2019]—the nearest populations appear to be on Long Island). Brief comparison was made with *Ambystoma punctatum* (= *Ambystoma maculatum*). Two specimens of *Ambystoma opacum* from the Roger Williams Park Museum were reported by Drowne (1905); the species was recorded from only two localities in the state by Raithel and Calhoun (1981) and was noted to be ‘present but infrequently seen’ by Raithel (2001). Documented and mapped occurrences (Raithel, 2019) cover much of the state, but are notably absent from Bristol County and along the shoreline areas of Narragansett Bay. There are 98 records of the species from Rhode Island in VertNet (80 at the American Museum of Natural History and 18 at the Museum of Comparative Zoology) but none are from Bristol County. No records from Bristol County appear on iNaturalist].

Bumpus, H. C. 1886. Reptiles and Batrachians of Rhode Island. Number XXIII. Random Notes on Natural History 3(10):76. [This installment included a prescient list of species that were not known from the state but were described in case some local specimens found their way into collections. Species discussed included *Gyrinophilus porphyriticus* and *Hemidactylium scutatum*. *Gyrinophilus* remained unrecorded in 1981 (Raithel and Calhoun, 1981), but was reported from the state in 1986 (Lazell and Raithel, 1986). It was listed as ‘rare/unusual’ by Raithel 2001, and in 2019 was still known from only two localities in the northwestern part of the state (Raithel, 2019). Six specimens of *Gyrinophilus* from Rhode Island are now listed in VertNet (two at the Museum of Comparative Zoology and four at the American Museum of Natural History, all from Providence County, the northernmost county of Rhode Island). Although Drowne (1905) reported *Hemidactylium scutatum* as ‘recorded from R. I.’ the first recorded specimen from Rhode Island was taken in 1958 (early reports were reviewed by Raithel, 2019), and the species was confirmed from only one locality in 1981 (Raithel and Calhoun, 1981). It was listed as ‘present but infrequently seen’ by Raithel (2001), and documented records were mapped from across much of the state (but not Bristol County) by Raithel (2019). 76 specimens of *Hemidactylium* are listed in VertNet from four of the five counties in Rhode Island; 24 records are recorded on iNaturalist, including one from Bristol County, thus confirming presence of the species in all five counties].

Bumpus, H. C. 1886. Reptiles and Batrachians of Rhode Island. Number XXIV. Random Notes on Natural History 3(11):83–84. [This installment continued a list of species that were known from neighboring states, but not yet reported from Rhode Island. Taxa discussed included *Spelerpes bilineata* (= *Eurycea bislineata*) and *Desmognathus fuscus*. *Eurycea bislineata* was recorded from ten localities by Raithel and Calhoun (1981) and it is now consid-

ered to be common in the state (Raithel, 2001). An updated distribution map for the state was provided by Raithel (2019). The VertNet database now includes 267 specimen records of *Eurycea bislineata*, from all five counties in the state. *Desmognathus fuscus* was listed from Scituate, Rhode Island by Drowne (1905) and was recorded from only three localities by Raithel and Calhoun (1981) and it was listed as ‘present but infrequently seen’ by Raithel (2001). A general summary of Rhode Island localities was provided by Raithel (2019) and his map shows scattered distribution across part of the state, excluding Bristol and Newport counties. There are 36 specimen records of *Desmognathus fuscus* in VertNet, but only from the three western counties (not Bristol or Newport counties).

OTHER HERPETOLOGICAL CONTENT IN *RANDOM NOTES ON NATURAL HISTORY*

Besides Bumpus’s serial installments, relatively little herpetological content appeared in *Random Notes on Natural History*. Almost all additional content was anonymous; the sole exception was the note about feeding of night herons in captivity by S. F. Deton (see below). Full citations to all additional herpetological content appear below, in serial order by issue number of the journal. We provide brief annotations for each.

Anonymous (“J. S. N.”). 1884. From the egg to the toad. *Random Notes on Natural History* 1(1):7. [Attributed to “J. S. N., in *Southern World*]. [Brief summary from laying eggs through metamorphosis to adult toad; no particular species is indicated].

Anonymous. 1884. [A clever process by which snails, frogs and other reptiles can be preserved and retain the color of the flesh]. *Random Notes on Natural History* 1(1):9. [Attributed to *American Angler*. Soak in chromic acid until hard, then wash with water, bathe in absolute alcohol, place in turpentine for three or four days, then paint entire body with solution of sugar and glycerine].

Anonymous. 1884. The roseate spoonbill in Florida rookeries. Part II. *Random Notes on Natural History* 1(4):7. [Brevard County, Florida; A spoonbill shot by author was “taken by an alligator and carried under” but was released when the alligator was hit on the head with a pole. “These huge reptiles were plentiful in the open water”].

Anonymous. 1884. The roseate spoonbill in Florida rookeries. Part III. *Random Notes on Natural History* 1(5):4–5. [Brevard County, Florida; An account of an alligator attacking a wounded ‘wood ibis’ (= wood stork, *Mycteria americana*)].

Anonymous. 1884. The roseate spoonbill in Florida rookeries. Part IV. *Random Notes on Natural History* 1(6):4. [Brevard County, Florida; an account of 50 alligators in and around a ponded area that was a rookery for spoonbills. Alligators were “unsuspecting” and “we hooked into one with the boat-hook and enjoyed quite a ride;” a second alligator was hand-fed a crow].

Anonymous. 1884. Frogs and toads. *Random Notes on Natural History* 1(6):7. [Brief summary of the differences between frogs and toads. “Our eastern North American toad, is *Bufo lentiginosus* of Shaw, the northern variety, *americanus*” [= *Bufo americanus*].

Anonymous. 1884. [Frederic A. Lucas volunteers services to aid our taxidermy department]. *Random Notes on Natural History* 1(8):3. [“Mr. Lucas has made a specialty of mounting reptiles, the turtles being favorites”].

Deton, S. F. 1885. The night heron. *Random Notes on Natural History* 2(2):9–10. [Species of night heron not indicated; young bird held in captivity and fed frogs and snakes (among other things). “Seems to enjoy nothing better than to fill his crop with frogs.” Particular species of frogs and snakes not indicated].

Anonymous. 1885. The New Orleans Exhibition. *Random Notes on Natural History* 2(3):x, xi. [A summary account of the preparation, transport, and exhibition of materials for the ‘World’s Industrial and Cotton Centennial Exhibition’ in New Orleans, that opened December, 1884. (Exhibits of mammals and birds) were “followed by an arrangement of the Turtles, mounted and naturally tinted, including all the varieties likely to be found in Rhode Island, except perhaps two of the marine forms. Our other reptiles and batrachians were represented by alcoholic preparations, and the paucity of species is in marked contrast with those of the Southern States”].

Anonymous. 1885. Desirable goods to be found at the Natural History Store of Southwick & Jencks, Providence, R. I. *Random Notes on Natural History* 2(4):xv. [This was the first listing of reptiles in the advertisements; six species of turtle were offered for sale but it is not clear whether these were alive or offered only as taxidermy specimens: *Xerobates carolina* (= *Gopherus polyphemus*, \$3.00), *Cistudo carolina* (= *Terrapene carolina*, \$1.50), *Nanemys guttata* (= *Clemmys guttata*, \$1.00), *Chrysemys picta*, \$1.00; *Glyptemys* {sic} *insculpta* (*Glyptemys insculpta*, \$1.00), *Chelydra serpentina*, \$2.00 to \$4.00. \$1 in 1885 = approximately \$31.80 in March 2024].

Anonymous. 1885. Lately received. *Random Notes on Natural History* 2(8):xxx. [Eggs of alligator offered for \$0.30. \$1 in 1885 = approximately \$31.80 in March 2024].

Anonymous. 1885. Prices for mounting mammals. *Random Notes on Natural History* 2(8):xxxi. [Alligator \$2.00 and upward; frogs \$1.25; turtles \$1.75 to \$5.00; large turtles for special prices. \$1 in 1885 = approximately \$31.80 in March 2024].

Anonymous. 1885. Prices for mounting mammals. *Random Notes on Natural History* 2(8):xxxii. [Six species of turtle are offered for sale: *Xerobates carolina* (= *Gopherus polyphemus*, \$3.00), *Cistudo carolina* (= *Terrapene carolina*, \$1.50), *Nanemys guttata* (= *Clemmys guttata*, \$1.00), *Chrysemys picta*, \$1.00; *Glyptemys* {sic} *insculpta* (*Glyptemys insculpta*, \$1.00), *Chelydra serpentina*, \$2.00 to \$4.00. \$1 in 1885 = approximately \$31.80 in March 2024].

Anonymous. 1886. Crocodile—Alligator. *Random Notes on Natural History* 3(7):52. [Brief discussion of the distribution of and differences between crocodiles and alligators].

Anonymous. 1886. To prepare turtles for skins or mounting. *Random Notes on Natural History* 3(8):58. [A method for preparation of turtle mounts].

Anonymous. 1886. The leather-backed turtle. (*Sphargis coriacea*). *Random Notes on Natural History* 3(9):72. [Description of a specimen of *Dermochelys coriacea* caught on 30 July in the vicinity of South East Point, Block Island; 5 feet 10 inches in length; spread of 6 feet 11 inches across front flippers and 3 feet 10 inches across the rear flippers; “The shape is almost exactly that of the shield on which the Goddess of Liberty leans on coins.” The specimen was not retained. This was published after Bumpus’s notation that no sea turtles had been recovered from Rhode Island waters (1884. *Reptiles and Batrachians of Rhode Island. Number II*). *Dermochelys* was reported by Blake and Raithel (1983) to be the most frequently encountered sea turtle on the shores of Rhode Island].

CONCLUSION

Random Notes on Natural History is not exceptionally rare, but it is certainly an unusual title. World Cat documents 38 institutions that report holdings, and at least 14 of those indicate they have volumes 1–3 (if all issues are present, those would be complete sets). Relatively modern reprints of individual volumes and sets are available online from various providers, but original printings are not as common. Clean scans of the journal are available on the Biodiversity Heritage Library (<https://www.biodiversitylibrary.org/item/49060#page/1/mode/1up>), and Google Books provides a reasonable scan of the set at <https://books.google.com/books?vid=HARVARD:32044106276389&printsec=titlepage#v=onepage&q&f=false> (accessed 4 December 2023).

Although Hermon C. Bumpus’s specific contributions to herpetology were few, each was timely and interesting. Most of his published herpetological work appeared early in his career—in his last year as an undergraduate at Brown University (1884), and in the years immediately after that (1885–1886). His writing is easy to read and mercifully free of jargon. He provided the first overview of the herpetology of the state of Rhode Island, and although it was necessarily somewhat speculative, some (but not all) of the species he predicted might be in the state were eventually discovered there. The importance of that serial publication was his effort to disseminate what he knew or suspected about the herpetology of Rhode Island to a broader audience of not only professionals, but also non-specialists, collectors, and natural history enthusiasts who made up much of the readership of *Random Notes on Natural History* (see Barrow, 2000). In that way his work on the herpetology of Rhode Island foreshadowed what would become the primary focus of his career—bringing the methods and deliverables of science to students and to the public at large.

His work on patterns of skeletal variation in *Necturus* places him as a pioneer in the use of X-rays for investigation of herpetological subjects. He began to use X-rays within months of their discovery and, again, there is a foreshadowing aspect of that work; the emergence of high-resolution X-ray computed tomography and its widespread availability at academic institutions and museums has now made use of X-rays commonplace in anatomical investigations of reptiles

and amphibians (e.g., Gauthier et al., 2012; Berkovitz and Shellis, 2017; Bell et al., 2021; Blackburn et al., 2024).

Setting herpetology aside, Bumpus had powerful influence on both science instruction and visitor experiences in museums and the national parks. It was in these arenas that he was perhaps at his best, if not always most appreciated. His focus on museums as centers of education with a unique role to play in public education brought him into conflict with colleagues and administrators who sometimes had alternative priorities. In spite of any resistance Bumpus managed to maintain a strong focus on bringing the fruits of science to the public through special programs, novel exhibit designs, and his serious engagement with the National Park Service late in his career. Much of that work was through his own initiative and action, but he appears to have been more interested in launching scientific investigations by inspiring others with ideas, concepts, and actions (Bumpus, 1947). He was not a prolific author, but he did take up the pen to share his thoughts on a diverse array of scientific topics, and especially on what he considered best practices in education and public outreach. Many of his ideas and practices are now re-emerging in modern higher education—notably his emphasis on experiential learning and his embrace of the concept of ‘open data,’ manifested in his case through the complete presentation of his data in his influential work on natural selection in sparrows (see Johnston et al., 1972; O’Donald, 1973). He seems to have been one of those remarkable scientists for whom action and inspiration truly spoke louder than his printed words.

ACKNOWLEDGEMENTS

We thank Breck Bartholomew for setting us on a path that led to the discovery of *Random Notes on Natural History*, and for sharing his work on use of X-rays in herpetology. Mary Poteet directed our attention to the report on the discovery of the first lizard caught in Rhode Island. Scarlett Talamantes assisted with tracking down the serial version of Roy Chapman Andrews’s report on his interactions with Hermon C. Bumpus. Ken Dodd shared his copies of the *Herp Watch* reports from 1981 and 1983, which we certainly otherwise would have missed, and also provided good conversation and suggestions to improve this paper. We thank Adam Marsh for sharing his thoughts on Bumpus’s education and outreach activities with visually impaired audiences, and his work in the national parks. Stacie Skwarcan made the digital modifications to our Figure 7 to make it legible; her time and efforts are much appreciated. Lauren Vonnahme and Breck Bartholomew worked to help us determine the fate of Bumpus’s specimens of *Thamnophis* from his time at Olivet College, and Matt Brown assisted with our efforts to determine the fate of the AMNH motto on the Guide Leaflet series. This manuscript was improved by reviews and discussions with Aaron Bauer, Breck Bartholomew, and John Moriarty; we appreciate their input and assistance. All errors remain our own.

REFERENCES

- Allen, J. A. 1868. Catalogue of the reptiles and batrachians found in the vicinity of Springfield, Mass., with notices of all the other species known to inhabit the state. *Proceedings of the Boston Society of Natural History* 12:171–204.
- Andrews, R. C. 1929a. Ends of the Earth. *Saturday Evening Post*, 14 September 1929 202(11):26–27, 227, 229–230.
- Andrews, R. C. 1929b. Ends of the Earth. Special National Travel Club Edition, G. P. Putnam's Sons, New York, New York. Frontispiece, x + 355 pp.
- Anonymous. 1885. The New Orleans Exhibition. *Random Notes on Natural History* 2(3):x, xi.
- Anonymous. 1899. Wood's Holl no longer exists. Massachusetts Post Office must go back to a plebeian name. *The New York Times*, October 24, 1899:1.
- Anonymous. 1901. Notes and news. *The American Museum Journal* 1(6):81–84.
- Anonymous. 1904a. [Obituary: James Mortimer Southwick]. *The Auk* 21:511.
- Anonymous. 1904b. Museum notes. *The American Museum Journal* 4(3):61–62.
- Anonymous. 1914a. [Notice of globes to be loaned to public school in which blind children are taught]. *The American Museum Journal* 14(4):167.
- Anonymous. 1914b. Dr. Bumpus heads Tufts College. *The New York Times*, September 18, 1914:18.
- Anonymous. 1918a. President Bumpus of Tufts resigns. *The New York Times*, December 14, 1918:13.
- Anonymous. 1918b. The Reptiles of Rhode Island. Part I—Turtles. *Park Museum Bulletin* [Roger Williams Park, Providence, Rhode Island] 10(1):81–84. [There are at least two versions of this issue; apart from the hours of operation, information content is identical but pages 81, 83, and 84 have slight format variations. At least this issue of the *Park Museum Bulletin* was released in a second edition dated November 1, 1924 (personal communication from Aaron Bauer, 2022)]. [Authorship was attributed to Marie E. Gaudette by Moriarty and Bauer (2000); see footnote 5, p. 51].
- Anonymous. 1918c. The Reptiles of Rhode Island. Part II—Snakes. *Park Museum Bulletin* [Roger Williams Park, Providence, Rhode Island] 10(2):85–88. [Authorship was attributed to Marie E. Gaudette by Moriarty and Bauer (2000); see footnote 5, p. 51].
- Anonymous. 1918d. The Batrachians of Rhode Island. Part I—Salamanders. *Park Museum Bulletin* [Roger Williams Park, Providence, Rhode Island] 10(3):89–92. [Authorship was attributed to Marie E. Gaudette by Moriarty and Bauer (2000); see footnote 5, p. 51].
- Anonymous. 1918e. The Batrachians of Rhode Island. Part II—Toads and Frogs. *Park Museum Bulletin* [Roger Williams Park, Providence, Rhode Island] 10(4):93–96. [Authorship was attributed to Marie E. Gaudette by Moriarty and Bauer (2000); see footnote 5, p. 51].
- Anonymous. 1943. [Hermon Carey Bumpus]. *School and Society* 57:702.
- Banks, R. C. 1997. In memoriam: John Warren Aldrich, 1906–1995. *The Auk* 114:748–751.
- Barrow, M. V., Jr. 2000. The specimen dealer: Entrepreneurial natural history in America's gilded age. *Journal of the History of Biology* 33:493–534.
- Bell, C. J., J. D. Daza, E. L. Stanley, and R. J. Laver. 2021. Unveiling the elusive: X-rays bring scolecophidian snakes out of the dark. *The Anatomical Record* 304:2110–2117.
- Berkovitz, B., and P. Shellis. 2017. *The Teeth of Non-Mammalian Vertebrates*. Academic Press, New York, New York. xi + 342 pp.
- Blackburn, D. C., D. M. Boyer, J. A. Gray, J. Winchester, J. M. Bates, S. L. Baumgart, E. Braker, D. Coldren, K. W. Conway, A. Davis Rabosky, N. de la Sancha, C. B. Dillman, J. L. Dunnum, C. M. Early, B. W. Frable, M. W. Gage, J. Hanken, J. A. Maisano, B. D. Marks, K. P. Maslenikov, J. E. McCormack, R. S. Nagesan, G. G. Pandelis, H. L. Prestridge, D. L. Rabosky, Z. S. Randall, M. B. Robbins, L. A. Scheinberg, C. L. Spencer, A. P. Summers, L. Tapanila, C. W. Thompson, L. Tornabene, G. J. Watkins-Colwell, L. J. Welton, the oVert Project Team, and E. L. Stanley. 2024. Increasing the impact of vertebrate scientific collections through 3-D imaging: The openVertebrate (oVert) Thematic Collections Network. *BioScience* 74(3):169–186.
- Blake, J. A., and C. Raithel. 1983. *Herp Watch 1983. A Project to Determine the Status and Distribution of Reptile and Amphibian Species in Rhode Island. A Joint Effort of The Audubon Society of Rhode Island and The Rhode Island Department of Environmental Management Natural Heritage Program*. [2] + 81 pp.
- Bumpus, H. C. 1885. Class VIII.—Reptilia. Pp. 345–468, 9 plates in *The Standard Natural History*. Vol. III. Lower Vertebrates (J. S. Kingsley, editor). S. E. Cassino and Company, Boston, Massachusetts.
- Bumpus, H. C. 1888. Class VIII.—Reptilia. Pp. 345–468, 9 plates in *The Riverside Natural History*. Volume III. Lower Vertebrates (J. S. Kingsley, editor). Houghton, Mifflin and Company, Boston, Massachusetts and New York, New York / The Riverside Press, Cambridge, Massachusetts.
- Bumpus, H. C. 1895. Laboratory teaching of large classes—Zoölogy. *Science*, n.s. 1:260–263.
- Bumpus, H. C. 1897. A contribution to the study of variation. (Skeletal variations of *Necturus maculatus Raf.*). *Journal of Morphology* 12(2):455–484, Plates A, B, C.
- Bumpus, H. C. 1899. [Eleventh lecture]. The elimination of the unfit as illustrated by the introduced sparrow, *Passer domesticus*. Pp. 209–226 in *Biological Lectures from the Marine Biological Laboratory Wood's Holl, Mass. 1898*. Ginn & Company, Publishers, the Athenæum Press, Boston, Massachusetts.
- Bumpus, H. C. 1908. Training by observation. *The World's Work* 16:10457.
- [Bumpus, H. C.]. 1933. *Trailside Notes*. Number One. Mammoth to Old Faithful. Yellowstone National Park, U. S. Department of the Interior, National Park Service. 35 + [1] pp. [Bumpus (1947:108) indicated this was authored anonymously by H. C. Bumpus (Sr.)].
- [Bumpus, H. C.]. 1936. *Trailside Notes*. Number Two. Fishing Bridge Museum to Mammoth Hot Springs. Yellowstone National Park, U. S. Department of the Interior, National Park Service. 23 + [1] pp. [Bumpus (1947:108) indicated this was authored anonymously by H. C. Bumpus (Sr.)].
- Bumpus, H. C., Jr. 1947. *Hermon Carey Bumpus*. Yankee Naturalist. The University of Minnesota Press, Minneapolis, Minnesota. Frontispiece, [4] + 141 pp., 9 un-paginated pages with 12 photographs.
- Buttemer, W. A. 1992. Differential overnight survival by Bumpus' house sparrows: An alternative interpretation. *The Condor* 94:944–954.

- Chapman, F. M. 1933. *Autobiography of a Bird-Lover*. D. Appleton-Century Company Incorporated, New York, New York. Frontispiece, xiii + [1] + 420 pp., 82 photos, 4 plates.
- Cope, E. D. 1885. Class VII.—Batrachia. Pp. 303–344, 1 plate in *The Standard Natural History*. Vol. III. Lower Vertebrates (J. S. Kingsley, editor). S. E. Cassino and Company, Boston, Massachusetts.
- Drowne, F. P. 1905. *The Reptiles and Batrachians of Rhode Island*. Roger Williams Park Museum [Providence, Rhode Island] Monograph 15. 24 pp.
- Garman, H. 1892. A synopsis of the Reptiles and Amphibians of Illinois. *Bulletin of the Illinois State Laboratory of Natural History* 3:215–388, 1 p. index, erratum sheet, Plates 9–15.
- Gauthier, J. A., M. Kearney, J. A. Maisano, O. Rieppel, and A. D. B. Behlke. 2012. Assembling the squamate tree of life: Perspectives from the phenotype and the fossil record. *Bulletin of the Peabody Museum of Natural History* 53(1):3–308.
- Harris, J. A. 1911. A neglected paper on natural selection in the English sparrow. *The American Naturalist* 45:314–318.
- Jessup, E. 1952. What's in a name. Woods Hole or Woods Holl – Old dispute even involved the postal service. *The New York Times*, June 15, 1952:x21.
- Johnston, R. F., D. M. Niles, and S. A. Rohwer. 1972. Hermon Bumpus and natural selection in the house sparrow *Passer domesticus*. *Evolution* 26:20–31.
- Langdon, S. 1906. The new museum idea. The interesting exhibits and the valuable instruction now given in a modern museum as shown by the work of Dr. E. {sic} C. Bumpus, the first president of the new American Association of Museums. *The World's Work* 12(3):7710–7712.
- Lazell, J. D., Jr., and C. Raithel. 1986. *Gyrinophilus porphyriticus porphyriticus* [Northern Spring Salamander]. *Herpetological Review* 17(1):26.
- Lucas, F. A. 1933. *The Hall of Dinosaurs*. Fourth Edition. The American Museum of Natural History, Guide Leaflet Series 70. 20 pp.
- Lucas, F. A. 1939. *The Hall of Dinosaurs*. Fifth Edition. The American Museum of Natural History, Guide Leaflet Series 70. 20 pp.
- Matthew, W. D., and S. H. Chubb. 1913. *Evolution of the Horse*. American Museum of Natural History, Guide Leaflet Series 36. 63 pp.
- Matthew, W. D., and S. H. Chubb. 1921. *Evolution of the Horse*. American Museum of Natural History, Guide Leaflet Series 36. 67 pp.
- McLeish, T. 2020. R.I.'s first lizard species discovered in South County. *Eco RI News*. Accessed 16 June, 2023.
- Mead, A. D. 1944. Hermon Carey Bumpus. May 5, 1862—June 21, 1943. *Science* 99:28–30.
- Mitchell, M. 1993. *Encyclopedia Brunoniana*. Brown University Library, Providence, Rhode Island. [8] + 629 pp. [Biographical sketch of Hermon C. Bumpus, pp. 102–105].
- Moriarty, J. J., and A. M. Bauer. 2000. *State and Provincial Amphibian and Reptile Publications for the United States and Canada*. Society for the Study of Amphibians and Reptiles, *Herpetological Circular* 28. iv + 52 pp.
- O'Donald, P. 1973. A further analysis of Bumpus' data: The intensity of natural selection. *Evolution* 27:398–404.
- Pauly, G. B., D. M. Hillis, and D. C. Cannatella. 2009. Taxonomic freedom and the role of official lists of species names. *Herpetologica* 65:115–128.
- Powell, R., R. Conant, and J. T. Collins. 2016. *Peterson Field Guide to Reptiles and Amphibians of Eastern and Central North America*. Fourth Edition. Houghton Mifflin Harcourt Publishing Company, New York, New York and Boston, Massachusetts. xiv + 494 pp.
- Preston, D. J. 1986. *Dinosaurs in the Attic*. An Excursion into the American Museum of Natural History. St. Martin's Press, New York, New York. xii + 244 pp., 36 photographs.
- Rainger, R. 1991. *An Agenda for Antiquity*. Henry Fairfield Osborn and Vertebrate Paleontology at the American Museum of Natural History, 1890–1935. The University of Alabama Press, Tuscaloosa, Alabama. xiii + [1] + 360 + [1] pp.
- Raithel, C. J. 2001. Amphibians. Pp. 34–35 in *Vertebrates of Rhode Island*. Volume 2 of *The Biota of Rhode Island*. The Rhode Island Natural History Survey, Kingston, Rhode Island.
- Raithel, C. J. 2019. *Amphibians of Rhode Island*. Their Status and Conservation. Rhode Island Division of Fish and Wildlife, West Kingston, Rhode Island. xiii + [2] + 317 pp.
- Raithel, C. J. 2021. Rhode Island. Pp. 369–371 in *The Timber Rattlesnake: Life History, Distribution, Status, and Conservation Action Plan* (A. R. Breisch, W. H. Martin, J. B. Sealy, C. E. Petersen, and E. Possardt, eds.). *Partners in Amphibian and Reptile Conservation (PARC) Technical Publication CAP-1*.
- Raithel, C., and J. B. Calhoun. 1981. *Herp Watch 1981*. A Project to Determine the Status and Range of Amphibian Species in Rhode Island. A Joint Effort Between The Audubon Society of Rhode Island and The Rhode Island Department of Environmental Management Natural Heritage Program. [2] + 43 + [3] pp.
- Rexer, L., and R. Klein. 1995. *American Museum of Natural History. 125 Years of Expedition and Discovery*. Harry N. Abrams, Inc., Publishers, in association with the American Museum of Natural History, New York, New York. 256 pp.
- Russell, C. P. 1943. Dr. Hermon Carey Bumpus. 1862–1943. *Yosemite Nature Notes* 22(12):97–101.
- Scott, D. E. 2005. *Ambystoma opacum* (Marbled Salamander). Pp. 627–632 in *Amphibian Declines*. The Conservation Status of United States Species (M. Lannoo, ed.). University of California Press, Berkeley, California.
- Southwick, J. M. 1886. [Editorial notice of discontinuation of publication]. *Random Notes on Natural History* 3(12):89.
- Southwick, J. M., and F. T. Jencks. 1884. *Catalogues issued by Southwick & Jencks' Natural History Store*. *Random Notes on Natural History* 1(1):8.
- Storer, T. I. 1922. The eastern bullfrog in California. *California Fish and Game* 8:219–224.
- Storer, T. I. 1925. A synopsis of the Amphibia of California. *University of California Publications in Zoology* 27:[2] + 1–343.
- Vaughan, A. L. 1914. The blind in the American Museum. *The American Museum Journal* 14(1):39–42.
- Walter, A. H. 1943. *Hermon Carey Bumpus*. *Naturalist*. Published by the Audubon Society of Rhode Island in Commemoration of its First President 1897–1901 and Honorary President 1941–1943. Providence, Rhode Island. 44 + [2] pp.
- Wilson, J. W. 1968. *The Jenks Museum of Brown University*. Books at Brown 22:41–57, 3 plates.
- Yuan, Z.-y., W.-w. Zhou, X. Chen, N. A. Poyarkov, Jr., H.-m. Chen, N.-h. Jang-Liaw, W.-h. Chou, N. J. Matzke, K. Iizuka, M.-s. Min, S. L. Kuzmin, Y. P. Zhang, D. C. Cannatella, D. M. Hillis, and J. Che. 2016. Spatiotemporal diversification of the true frogs (genus *Rana*): A historical framework for a widely studied group of model organisms. *Systematic Biology* 65:824–842.

HERMON CAREY BUMPUS AND THE *REPTILES AND BATRACHIANS OF RHODE ISLAND*, WITH COMMENTS ON
OTHER HERPETOLOGICAL CONTENT IN *RANDOM NOTES ON NATURAL HISTORY*, 1884–1886

We suggest the following format for citing this article:

Bell, C. J. and T. J. LaDuc. 2024. Hermon Carey Bumpus and the *Reptiles and Batrachians of Rhode Island*, with Comments on Other Herpetological Content in *Random Notes on Natural History*, 1884–1886. *Bibliotheca Herpetologica* 18(4):44–59.



Two Largely Forgotten Early Sources on the Fer-de-Lance of Martinique, *Bothrops lanceolatus*

Aaron M. Bauer¹, Robert Powell², Aaron H. Griffing³

¹Department of Biology and Center for Biodiversity and Ecosystem Stewardship,
Villanova University, Villanova, PA 19085, USA; aaron.bauer@villanova.edu

²Department of Biology, Avila University, Kansas City, MO 64145, USA; robert.powell@avila.edu

³Department of Chemical & Biological Engineering and Department of Molecular Biology,
Princeton University, Princeton, NJ 08544, USA; ag3200@princeton.edu

INTRODUCTION

Bothrops lanceolatus, the Martinique Lancehead, commonly called the “Fer-de-Lance” (Fig. 1), is a large pitviper of both medical importance and conservation concern. The species was described by La Cépède (1789), but because names in this work were ruled by the International Commission for Zoological Nomenclature to be unavailable (Anonymous 1987), most subsequent authors have attributed authorship to Bonnaterre (1790), who used La Cépède’s name (*Coluber lanceolatus*) and repeated his content (e.g., McDiarmid et al. 1999; Wallach et al. 2014). However, problems exist with this authorship as well, and the actions of the Commission might have left the universally used scientific name for this snake unavailable (Dubois et al. 2021; Bauer and Powell, submitted). This nomenclatural issue aside, the sources for information about the Fer-de-Lance available to La Cépède and Bonnaterre were limited.

The earliest published sources for the Fer-de-Lance are three early French authors, Jean-Baptiste Du Tertre (1654, 1667), Charles de Rochefort (1658, 1666, 1667), and Jean-Baptiste Labat (1722*a-b*, 1742). Du Tertre (1610–1687) was a Dominican clergyman who spent 18 years in the Antilles, including several years in Martinique, Rochefort (1605–1683) was Huguenot minister who lived in the West Indies for over a decade from the mid-1630s to the mid-1640s, but did not reside in Martinique, and Labat (1663–1738), another Dominican clergyman, spent twelve years in the Antilles (1694–1706), the majority on Martinique. Du Tertre’s work was heavily plagiarized by Rochefort, whereas Labat provided original information about the Fer-de-Lance, although some of it was sensationalized.

La Cépède’s (1789: 121–131) 11-page French text on “la vipère fer-de-lance” (Fig. 2) cited four specific sources: Rochefort (1667), unpublished communications from [Barthélemy de] Badier (1740?–1789), a planter from Guadeloupe, who studied chemistry and botany in Paris (McClellan and Regourd 2001), and two contributions from the *Nouvelles de la République des Lettres et des Arts*, one (the *Mémoire*;

Fig. 3) with no identified author (Anonymous 1786) and the other (the *Lettre*; Fig. 4) by M. Bonodet de Foix (1786). These two contributions were cited for a variety of topics, including aspects of reproduction (e.g., litter size, gestation time, size and color at birth), the speculation that the pit organ was an auditory structure, the behavior of the snake after feeding, the effects of its venom, and the efficacy of treatments—with the two sources giving very differing accounts of the last of these. Bonnaterre (1790: viii) introduced new information communicated to him from an unpublished manuscript by the French Minim friar Charles Plumier (1646–1704) by the noted Berlin physician and ichthyologist Marcus Elieser Bloch (1723–1799), who had purchased it at public auction (Pietsch 2017). He also cited La Cépède (1789) and Rochefort (1667), giving page references for both, and the *Mémoire* and *Lettre*, for which he gave only the year of publication (1786), as did La Cépède (1789).

After Bonnaterre, the publications in *Nouvelles de la République des Lettres et des Arts* were widely cited for nearly a century in many broad herpetological works (Bechstein 1801; Latreille in Sonnini and Latreille 1801; Daudin 1803; Lenz 1870), works on venoms, poisons and medicine (Gmelin 1806, 1811; Laboulbène 1869), natural history encyclopedias and compendia (Lenz 1843, 1852*a*, 1852*b*, 1864, 1878; Brehm 1869, 1878), general encyclopedias and magazines (Duchesne 1801; Steger 1870), as well as in the most detailed treatments of the snake (Rufz 1845*a*, 1845*b*, 1860). In the last 145 years, however, we found mentions of Bonodet only in Lalung (1934), a short book on the Fer-de-Lance, and Dewynter et al. (2023), a modern work on the herpetofauna of Martinique. Nothing in any of these works, though, suggests that the authors subsequent to La Cépède actually consulted an original copy of the *Nouvelles de la République des Lettres et des Arts*. Indeed, some references confound the information from the anonymous *Mémoire* with that from the *Lettre* by Bonodet, and only one provides a full citation for the work, with all others repeating instead only the journal title and year, as in *Histoire Naturelle des Serpens*. The sole exception is Dewynter et al. (2023), whose bibliography



Fig. 1. Fer-de-Lance (*Bothrops lanceolatus*). Living adult female specimens from Le Bois-Soldat, Le François, La Martinique, showing the facial pits. Photo courtesy of Maël Dewynter.

lists: “Anonyme [Bonodet de Foix] (1786) Amérique. Histoire naturelle. [Le Serpent de la Martinique]. *Nouvelles de la République des Lettres et des Arts*, 7(42): 461–462,” which incorrectly attributes the anonymous *Mémoire* to Bonodet de Foix, while omitting the actual *Lettre* by this author.

Because these two elusive papers in the *Nouvelles de la République des Lettres et des Arts* were apparently critical sources informing the early literature of the Fer-de-Lance, we undertook to consult them directly (perhaps for the first time in well over two centuries) to clarify how much of La Cépède’s (1789) account, and those of others, depended on the information they provided. We here present a translation of these key early works on the Fer-de-Lance, along with biographical information about Bonodet de Foix, bibliographic data about *Nouvelles de la République des Lettres et des Arts*, and an evaluation of both the veracity and the significance of statements about the Serpent de la Martinique made by Bonodet and the anonymous author of the *Mémoire*.

BONODET DE FOIX

Jean Louis Bonodet de Foix (Fig. 5) was described in the editor’s introduction to the *Lettre* as a trial attorney in the Superior Council of Martinique. He was born in Paris, possibly around 1745 (although dates as early as 1715 and as late as 1758 have been claimed), to Louis Bonodet de Foix (died 1774) and Anne Marguerite Couffier de Gergy. He was a licentiate of the University of Paris (Archives Nationales d’Outre-Mer COL E40, ark:/61561/up424jdllld) and likely moved to the Antilles sometime shortly after completing his degree. By 1771 he was in Guadeloupe working for the government and made an impression on the Intendant Général des Îles du Vent de l’Amérique (Superintendent of the Windward Islands), Philippe-Athanase de Tascher (or Däscher), who served in the position from 1771 to 1777. According to a letter (4 September 1775) from Tascher (Archives Nationales d’Outre-Mer COL E40, ark:/61561/up424jdllld), Bonodet had served ably as a prosecutor in Guadeloupe and Marti-



Fig. 2. Plate V from La Cépède (1789), *Histoire Naturelle des Serpens*, illustrating “La Vipère Fer-de-Lance” (*Bothrops lanceolatus*) as Figure 1 and “La Tête-Triangulaire” (*Craspedocephalus trigoniceps* or *C. capitetriangularis* [valid name currently contested]) as Figure 2.

nique for the previous four years (from 1771 to 1775 when Martinique and Guadeloupe had a shared administration). However, in early 1774 he resigned the position of “Procureur en Grande Terre” [Prosecutor in Grande Terre, Guadeloupe] (Rossignol and Rossignol 1987), presumably precipitated by his move to Martinique. On 9 August 1774 he married Marie Polixène Blanvillain de l’Isle (ca. 1732–1826), a resident of Martinique, and in the same year the couple gave birth to Marie-Anne Polixène (1774–1807).

Documents from 1776 and 1777 (Archives Nationales d’Outre-Mer COL E40, ark:/61561/up424jdllld) give Bonodet de Foix’s title as “Procureur à St. Pierre” and show that he unsuccessfully tried to obtain a promotion to the position of “Procureur du Roi” in both Saint-Pierre (Martinique) and Pointe-à-Pitre (Guadeloupe). His position in the early 1780s has been described as “avocat en parlement, procureur au Conseil souverain de la Martinique” [trial attorney in parliament and prosecutor at the Sovereign Council of Martinique] (Bruneau-Latouche 1996). In 1785 he formed a partnership with another lawyer, Joseph Augustin Crassous de Médeuil (1755–1830) (Bruneau-Latouche 1996). Crassous de Médeuil served on the Conseil Souverain de Martinique and

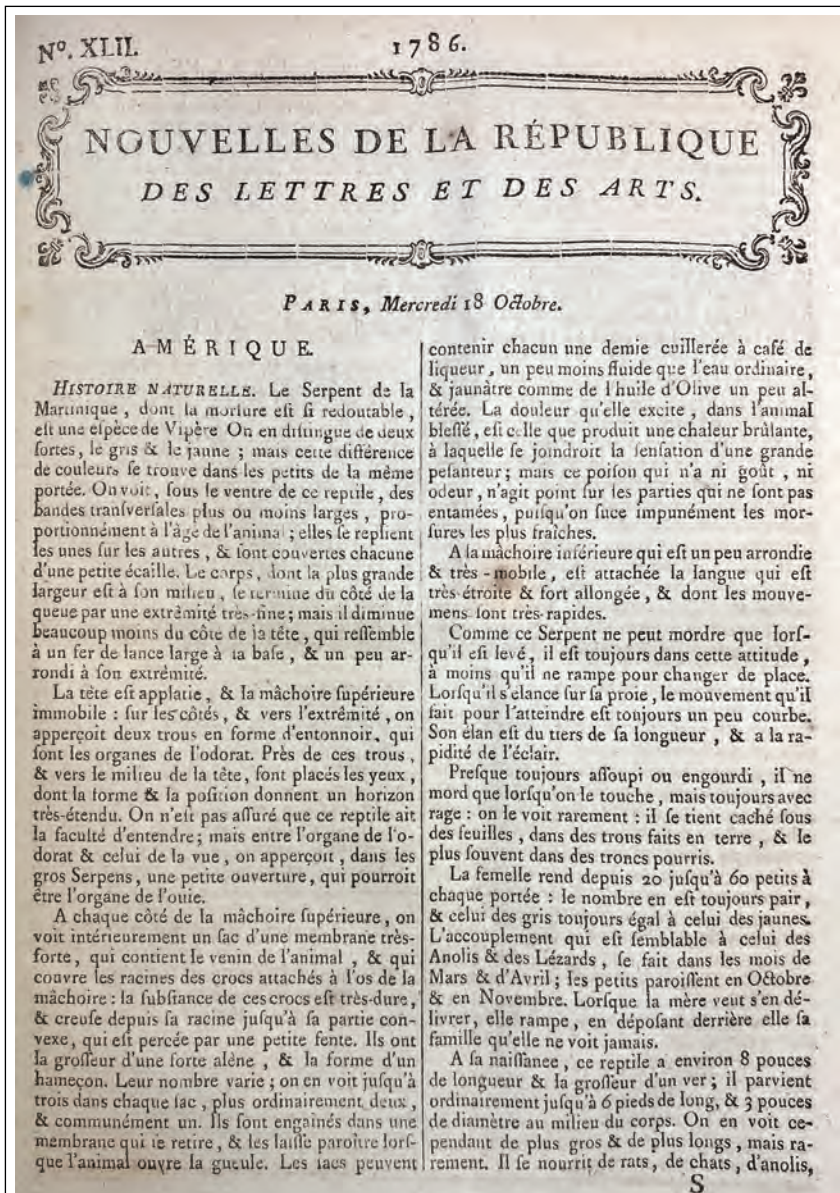


Fig. 3a. Anonymous 1786 *Mémoire* on Le Serpent de la Martinique from the *Nouvelles de la République des Lettres et des Arts*, 7(42):461.

went on to be active in the French Revolution, returning to France, where he served as the member of the Convention National representing Martinique starting in 1792. He became Secretary of the Convention in 1794 and was active in the Montagnard faction of the Jacobin Club, the radical leftist political group to which Maximilien Robespierre (1758–1794) belonged. The business with Crassous de Médeuil was formally dissolved on 25 April 1789 owing to Bonodet's death (Bruneau-Latouche 1996), although the actual date of death is uncertain. Assuming a 1745 birth date, Bonodet would have been about 25 when he came to the Antilles, 29 when he married, and 44 when he died. Although many key dates in his life remain vague, that he travelled with his wife and six-year-old son, Philippe Auguste, to France is known. The family arrived in Le Havre from Martinique on 9 July

1786 (Clifford et al. 2011), just a few months before his letter on the Serpent de la Martinique was published.

NOUVELLES DE LA RÉPUBLIQUE DES LETTRES ET DES ARTS

Nouvelles de la République des Lettres et des Arts was published in nine volumes between 26 January 1779 and 16 July 1788, exclusive of 1784, although a prospectus and preliminary issues appeared in 1777. It was initially published biweekly on Tuesdays, but from volume 3 in 1781 it became a weekly, appearing every Wednesday. It was founded and edited by Claude-Mammès Pahin de la Blancherie (1751–1811) and served as the outlet of the “Correspondance générale pour les Sciences et les Arts,” a literary society he had founded in 1777. The society attempted to bring together French and visiting foreign artists, scientists, and men of letters, and met weekly at the salon of the Correspondence at the Hôtel Villayer in Paris. The periodical presented a diverse array of information regarding science, art, literature and other topics, and a supplement, *Salon de la Correspondance pour les Sciences et les Arts*, reported on the weekly meetings of the society. From 1785 the supplement was included in the general pagination of the journal. Its end came when Pahin de la Blancherie departed for London, where he tried to establish a similar group (Guénou 1981, 1985, 1988). Surviving copies of the journal are rare and issues available online through *Gallica*, Bibliothèque Nationale de France, do not include the issues of relevance to the Fer-de-Lance. We accessed a hard copy of the journal through the Princeton University Library and Special Collections, Princeton, New Jersey, USA.

TRANSLATIONS

Mémoire (Figure 3)

Anonymous. 1786. [Le serpent de la Martinique]. *Nouvelles de la République des Lettres et des Arts* 7(42): 461–462.

PARIS, Wednesday October 18

AMERICA

NATURAL HISTORY. The Martinique Snake, whose bite is so formidable, is a species of Viper. There are two morphs, the gray and the yellow ones; but this difference in colors is found in the young of the same litter. We see, under the belly of this reptile, transverse bands of varying width, in proportion to the age of the animal; they fold over each other and

are each covered with a small scale. The body, the greatest width of which is in the middle, ends on the side of the tail with a very fine end; but it decreases much less on the side of the head, which resembles a broad spearhead at the base, and is a little rounded at its end.

The head is flattened, and the upper jaw immobile: on the sides, and toward the end, we see two funnel-shaped holes, which are the organs of smell. Near these holes, and toward the middle of the head, are placed the eyes, whose shape and position give a very wide field of vision. It is not certain that this reptile has the ability to hear; but between the organ of smell and that of sight, we see, in the large serpents, a small opening, which could be the organ of hearing.

On each side of the upper jaw, we see internally a very strong membranous sac, which contains the venom of the animal, and which covers the roots of the fangs attached to the jawbone: the substance of these fangs is very hard, and hollow from its root to its convex part, which is pierced by a small slit. They are the thickness of a strong awl, and the shape of a fishhook. Their number varies, we see up to three in each sac, more usually two, and commonly one. They are sheathed in a membrane which retracts and allows them to appear when the animal opens its mouth. The sacs can each contain half a teaspoon of liquid, a little less fluid than ordinary water, and yellowish like slightly spoiled olive oil. The pain that it excites in the injured animal is that produced by a burning heat, to which is added the sensation of great sluggishness; but this poison, which has neither taste nor smell, does not act on the parts which are not cut into, because the freshest bites are sucked with impunity.

To the lower jaw, which is a little rounded and very mobile, is attached the tongue, which is very narrow and strongly elongated, and whose movements are very rapid.

As this Snake can only bite when it is raised, it is always in this position, unless it crawls to change place. When it strikes at its prey, the movement it makes to reach it is always a little curved. Its extension is a third of its length and has the speed of lightning.

Almost always drowsy or sluggish, it only bites when touched, but always with fury. We rarely see it: it hides under leaves, in holes made in the ground, and most often in rotten trunks.

The female produces from 20 to 60 young in each litter: the number is always even, and that of gray colored specimens is always equal to that of yellow individuals. Mating,

462

de gibier & de volaille. Sa gueule a la faculté de s'ouvrir énormément, & son oesophage, celle de se dilater considérablement, puisqu'on lui a vu avaler un cochon de lait. Un de ces reptiles ayant avalé un gros Manitou ou Didelphe, enfla considérablement & mourut. Seroit-ce une indication que le Manitou est un poison pour le Serpent, comme la Galère de Mer, & la Sardine Dorée le sont pour certains animaux.

Lorsque le Serpent a mordu sa proie, il en suit les traces en se traînant avec peine; mais guidé par la vue & l'odorat qu'il a d'une grande finesse, il ne tarde pas à la trouver abattue par la force du venin qu'il lui a inoculé; il l'avale toujours en commençant par la tête, & reste ensuite très-long-tems dans un état d'engourdissement qui le rend immobile. Sa digestion est très-lente, & paroit être l'effet de la putréfaction. Il est certain du moins que si l'on tue un Serpent quelque-tems après qu'il a pris de la nourriture, il exhale de son corps une odeur insupportable.

On ne connoît point d'exemple de gens qui aient été guéris de la morsure des gros Serpens. Les malades meurent quelquefois dans l'espace de six heures, & toujours dans des douleurs vives & des angoisses inexprimables. Une sueur froide & la pâleur du visage précédent & annoncent une mort prochaine. La morsure des petits Serpens n'est pas moins dangereuse, mais elle a quelques symptômes différens. La partie blessée n'enfle point; le malade ne souffre pas, ou n'éprouve que des douleurs légères; mais il se déclare souvent une paralysie sur des parties différentes de celle qui a été mordue.

Les remèdes qu'on a employés jusqu'à présent sont la succion, les fomentations huileuses, une tisane avec l'espèce de Tithymale, appelée la *Mal nommée*, dans laquelle on délaye un peu de thériaque, l'eau de Luce, les vésicatoires, les suppuratifs, l'émétique, les aillands ou bols d'ail pilés joints à quelques grains d'émétique. Aucun n'a réussi: les secrets des plus célèbres panseurs ou *Pidils* n'ont pas plus d'efficacité.

Cependant comme il faut chercher du moins à diminuer les souffrances cruelles du malade, l'Auteur de ce Mémoire se sert, pour cet objet, de la succion, de l'huile en fomentation, & de la boisson de quinquina prise en grande quantité. Il a reconnu aussi que l'approche du feu modéroit les douleurs. Mais convaincu de l'inutilité de tous ces moyens pour opérer la guérison de la maladie, il invite les gens de l'Art à communiquer au Public leurs vues sur les remèdes qu'ils jugeront pouvoir être essayés avec succès.

ITALIE.

BEAUX-ARTS. La seconde édition de l'Ouvrage, intitulé: *Bâtimens & Dessins d'Architecture*, par André Palladio, que J. Rossi, Imprimeur à Vicence, avoit promise au Public, est entièrement terminée. Elle est en quatre volumes in-folio, & contient toutes les Planches qui se trouvent dans la première édition. Le Prix, qui est le même pour le Texte François que pour l'Italien, est de 110 liv. de Venise (61 liv. 2 s. 2 d. de France) en feuilles. Ceux qui ne voudront que les Planches, les payeront 88 liv. de Venise, ou 48 liv. 17 sols 9 den. de France.

COMMERCE. M. l'Abbé Baldaferoni vient de publier le second volume de son *Traité des Assurances Maritimes*. L'Auteur (1) y considère le contrat d'assurance, dans les cas où les effets assurés sont endommagés ou perdus, & y discute les fins de non-recevoir que l'Assureur peut faire valoir. Ce volume est terminé par un *Traité* particulier, sur le contrat dans lequel l'argent est placé à la grosse aventure. L'Ouvrage de M. B. n'est pas une simple compilation des Loix & des Coutumes. Il y règne un esprit philosophique qui remonte aux principes, développe les abus, donne des vues nouvelles, & propose des changemens avantageux qui perfectionneroient cette partie de la Jurisprudence.

LITTÉRATURE. Personne n'étoit peut être plus en état que le Père Jaquier de composer l'Eloge Académique de l'Abbé Frisi (2). On ne sera donc pas surpris d'y trouver un exposé clair & détaillé des travaux du célèbre Mathématicien que nous regrettons. Mais en développant le mérite de ce Savant, l'Orateur n'a dissimulé ni les défauts, ni les erreurs. Si cet exemple étoit suivi dans les Eloges Historiques, les louanges qu'ils renferméroient seroient plus honorables, & le Public retireroit plus d'instruction de ce genre d'Ouvrages.

ANGLETERRE.

ÉCONOMIE POLITIQUE. Nous avons porté l'Agriculture & le Commerce à un point de perfection que les autres Nations nous envient. Mais

(1) *Delle Assicurazioni Marittime, Trattato dell'Aw. Alesand. Baldaferoni, tomo II. Firenze 1786, nella Stamperia Bonaldiana, in-8°. Voyez Nouvelles de la République des Lettres 1786, N°. XIV.*
(2) *Logio Academico del celebre Matematico Sig. Ab. Frisi, recitato in Arcadia dal P. Francesco Jacquier, Venezia 1786, presso Simone Occhi, in-8°.*

Fig. 3b. Anonymous 1786 *Mémoire* on Le Serpent de la Martinique from the *Nouvelles de la République des Lettres et des Arts*, 7(42):462.

which is similar to that of anoles and Lizards, takes place in the months of March and April; the neonates appear in October and November. When the mother wants to give birth, she crawls, leaving behind her family whom she never sees.

At birth, the reptile is about 8 inches long and the thickness of a worm; it usually reaches 6 feet in length and 3 inches in diameter at the middle of the body. However, we see thicker and longer ones, but rarely. It feeds on rats, cats, anoles, game and poultry. Its mouth has the ability to open enormously and its esophagus to dilate considerably, since it has been seen to swallow a suckling pig. One of these reptiles, having swallowed a large Manitou or Didelphe¹, swelled considerably

¹Common Opossum (*Didelphis marsupialis*). In fact, the local name in Martinique is Manicou, not Manitou.

nous fait, il sera composé de tout ce qui peut avoir relation aux Sciences, aux Arts & aux Lettres. Il est permis d'espérer de l'agrément & de nouvelles lumières d'un plan si bien conçu? Pour mettre cette feuille plus à la portée de toutes les classes de la société, les Auteurs se proposent d'éviter, autant qu'ils le pourront, les expressions techniques ou recherchées; & si ils sont contraints d'y avoir recours, ils les expliqueront par des notes. On nous assure que ce Journal n'aura aucun objet de ressemblance avec les Ouvrages Périodiques qui jusqu'ici ont paru en Suisse. Tant mieux, si c'est de leur texture qu'a dépendu leur peu de succès? Les personnes qui ont des connoissances dans l'agriculture, sont priées de faire part de leurs découvertes; mais on désireroit sur-tout qu'elles eussent pour objet les terres à rables & à vignobles du pays, & qu'elles missent les Auteurs dans le cas de publier souvent de nouveaux procédés, dont le Cultivateur pauvre & presque sans ressource, puisse profiter, aussi-bien que celui qui est dans l'aisance (1).

FRANCE.

PHYSIQUE. M. le Dru, qui s'occupe depuis long-tems d'appliquer l'Électricité au traitement de l'Epilepsie, a cherché à perfectionner la Machine dont il fait un si fréquent usage, & en a imaginé une, qui est plus portative que celles dont on se sert ordinairement, & qui donne une Électricité plus forte, soit positive, soit négative.

Cette Machine est composée: 1°. d'un plateau tournant verticalement dans son support ou chape entre les coussinets ordinaires; mais ceux-ci sont montés à vis, de manière qu'on peut leur substituer des godets, armés d'une pointe, placée dans la direction de leur axe. Cette pointe communique au-dehors de la vis & de la chape, par un fil métallique, auquel on peut accrocher la chaîne qui doit pendre à terre pour électriser en moins.

2°. D'une colonne de verre qui est établie à

(1) Ce Journal paroîtra toutes les semaines. Il aura quatre pages in-4°.

Le prix de l'abonnement est de 4 livres de Suisse, ou 6 livres de France, payables en souscrivant.

Le premier N°. paroîtra le 2. Décembre prochain, & ce premier mois ne sera pas compté aux Abonnés Fondateurs.

On souscrit à Laufame, chez M. J. Lanteiras, propriétaire, ou chez MM. J. P. Heubach & Compagnie, Mourer Cadet, & F. Lacombe, Libraires.

On peut s'arranger pour souscrire avec MM. les Directeurs des Postes.

Les envois doivent être affranchis.

505
coulisse sur la table, & qui porte à son sommet une fourchette de métal, dont les branches reçoivent les coussins qui frottent de part & d'autre le plateau. A la hauteur de son axe, cette fourchette porte le crochet, où l'on passe la chaîne qui correspond au malade pour électriser en moins.

Lorsque l'on veut électriser en plus, on substitue les coussins aux godets, & on retire de la coulisse la colonne de verre.

RÉCLAMATION. M. Bonodet de Foix, Avocat au Conseil Supérieur de la Martinique, qui se trouve, dans ce moment, en Europe, vient d'adresser de Malsherbes, à M. l'Agent-Général, la Lettre suivante.

« On voit, dans la Feuille de la Correspondance, N°. XLII, une dissertation sur le Serpent de la Martinique. En rendant hommage aux vues de l'Auteur, on ne peut convenir avec lui de l'inutilité des moyens employés contre la morsure de ce Reptile.

« Sans doute l'intérêt de l'humanité exige d'un Savant qu'il étende ses recherches à la guérison d'un mal supérieur à tous les remèdes connus; mais si ce mal, au contraire, est toujours combattu avec succès, la démarche de celui qui sollicite de nouveaux secours n'est pas seulement superflue; elle peut devenir nuisible, en écartant d'un Pays où l'on ne sauroit vivre que dans de continuelles alarmes; & telle est celle de l'Ecrivain, auquel on répond. Qui se hasarderà, après l'avoir lue, à passer à la Martinique? Qui ne craindra d'y rencontrer la mort à chaque pas? Qui osera seulement y avoir des propriétés?

« Fixé dans cette île, depuis plus de douze ans, celui qui répond, n'y a point été mordu; quoiqu'il ait habité la campagne, & souvent parcouru les bois. Le Serpent est multiplié; cependant il est rare qu'il pénètre dans les maisons des champs; jamais on ne le trouve dans celles des Villes. Ses retraites les plus ordinaires sont les cannes à tuer, où il est attiré par les rats dont il se nourrit. Ceux qui restent dans les bois, cachés dans des trous, sont, par-là même, peu dangereux. On est averti de leur présence, on par l'odeur fétide qu'ils exhalent, on par le cri de certains oiseaux (1) qui se rassemblent & volent sans cesse autour d'eux. Prévenu, d'ailleurs, de l'existence du Serpent, on apporte aux travaux, dans les lieux où l'on en suppose, les précautions propres à s'en garantir.

« On ne doit pas néanmoins dissimuler qu'elles

(1) La Gorge-blanche & le Rossignol.

killed by the force of the venom which it has inoculated; it always swallows it starting with the head, and then remains for a very long time in a state of torpor which renders it immobile. Its digestion is very slow and appears to be the effect of putrefaction. It is at least certain that if one kills a snake some time after it has taken food, an unbearable odor exudes from its body.

We do not know of any example of people who have been healed from the bite of large individuals of this snake. Victims sometimes die within six hours after the bite, and always in severe pain and unspeakable anguish. A cold sweat and paleness of the face precede and announce an imminent death. The bite of small Snakes is no less dangerous, but it has some different symptoms. The wounded part does not swell; the patient does not suffer, or only experiences slight pain; but paralysis often occurs in parts different from that which was bitten.

The remedies that have been used until now are suction, oily poultices, an herbal tea with the species of spurge, called the *Mal-nommée*³, in which a little theriac⁴ is diluted, eau de Luce⁵, blistering agents, suppurating agents, emetics, aillauds⁶ or bowls of crushed garlic combined with a few grains of emetic. None have succeeded: the secrets of the most famous healers or *Pidils* are no more efficacious.

However, as we must at least seek to reduce the cruel suffering of the patient, the Author of this Memoir uses, for this purpose, suction, a poultice of oil, and the drink of quinquina⁷ taken in large quantities. He also recognized that approaching the fire moderates the pain. But convinced of the uselessness of all these means to bring about the cure of the disease, he invites people of the Art [of medicine] to

Fig. 4a. The 1786 *Lettre* by Bonodet de Foix from the *Nouvelles de la République des Lettres et des Arts*, 7(47):505 right column.

and died. Could this be an indication that Manitou is a poison for the Snake, as the Galère de Mer, and the Golden Sardine² are for certain animals?

When the Serpent has bitten its prey, it follows its tracks by dragging itself with difficulty; but guided by sight and smell, which is very keen, it does not take long to find it

²Galère de Mer refers to mantis shrimp or stomatopods. The Golden Sardine may be *Sardinella aurita*, although various medical authors refer it to *Clupea thryssa* (syn. *Opisthonema oglinum*). Desportes (1770) referred to it as being known as *cayeux* in the French West Indies. The illness suffered from eating it is likely clupeotoxism, which can result from eating clupeiform fish that have ingested dinoflagellates that produce palytoxin, a highly poisonous substance that causes extreme vasoconstriction. Its effects were reported by Du Tertre as early as the mid-17th century.

³*Euphorbia hirta*, or asthma plant, is a weed traditionally used in folk medicine for the treatment of a variety of ailments.

⁴An antidote to snakebite as well as other poisons or toxins that dates back to antiquity. It typically had many ingredients that sometimes included parts of venomous snakes themselves.

⁵An antispasmodic and stimulant made from white soap in spirit of wine with the addition of oil of amber and sal ammoniac.

⁶“aillaud” is assumed to be a local name for a garlic and emetic mix. We could find no reference to the term in any French or Creole dictionary or in any medical sources. Duchesne (1801) paraphrased this passage and presented the term as “nillauds,” but no trace of this term exists in the literature either.

⁷Sweet wine with quinine.

communicate to the Public their views on the remedies which they judge can be tried with success.

Lettre (Figure 4)

Bonodet de Foix, [J. L.] 1786. [Sur la serpent de la Martinique]. *Nouvelles de la République des Lettres et des Arts* 7(47): 505–506.

OBJECTION. Mr. Bonodet de Foix, Trial attorney at the Superior Council of Martinique, who is currently in Europe, has just sent from Malsherbes, to the Agent-General [i.e., Pahin de la Blancherie], the following Letter.

“One sees, in Issue No. XLII, a dissertation on the Serpent of Martinique. While giving respect to the views of the Author, we cannot agree with him on the uselessness of the means used against the bite of this Reptile.

“No doubt the interest of humanity demands that a Scientist extend his research to the cure of an illness superior to all known remedies; but if this illness, on the contrary, is always combated successfully, the approach of the one who solicits new aid is not only superfluous; it can become harmful, causing us to withdraw from a country where we can only live in constant alarm; and such is that of the Writer, to whom we respond. Who will venture, after reading it, to go to Martinique? Who will not fear encountering death at every step? Who will even dare to have properties there?

“Settled on this island for more than twelve years, the person who responds has not been bitten there, although he has lived in the countryside and often traveled through the woods. The Serpent has increased: be that as it may, it is rare that it enters the houses of the fields; we never find it in those of the Cities. His most ordinary retreats are the sugar canes, where he is attracted by the rats on which he feeds. Those that remain in the woods, hidden in holes, are therefore not very dangerous. We are alerted to their presence, either by the fetid odor they exhale or by the cry of certain birds⁸, which gather and constantly flutter around them. Moreover, warned of the existence of the Serpent, we take to work in the places where it is suspected the precautions appropriate to guarantee against it.

“We must not, however, conceal the fact that they are sometimes insufficient; but the inconvenience of being bitten is almost always the only thing we have to complain about.

⁸[Bonodet’s footnote (1)]: The White-Throat [White-breasted Thrasher, *Ramphocinclus brachyurus*] and the Nightingale [Tropical Mockingbird, *Mimus gilvus*].

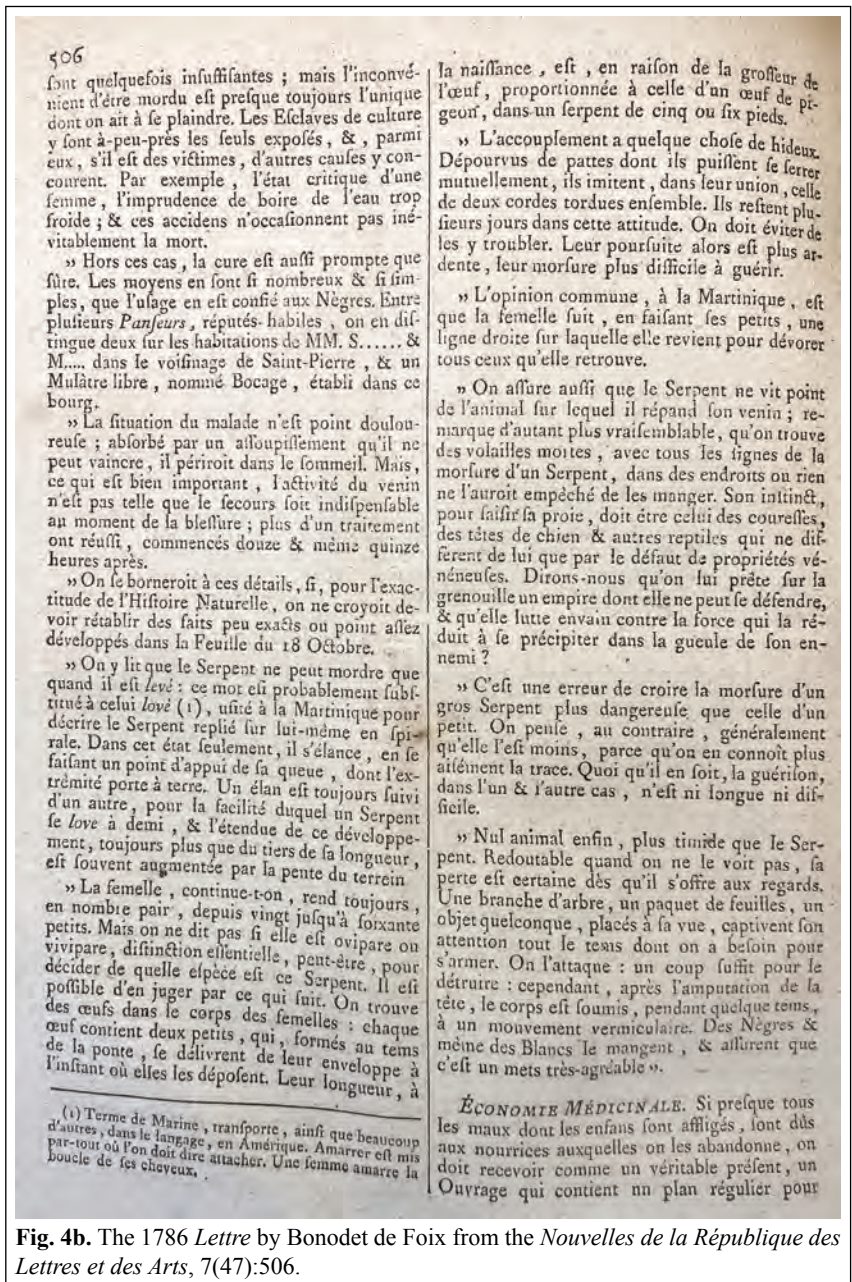


Fig. 4b. The 1786 *Lettre* by Bonodet de Foix from the *Nouvelles de la République des Lettres et des Arts*, 7(47):506.

Field Slaves are almost the only ones exposed, and, among them, if there are victims, other causes contribute. For example, the critical condition of a woman, the recklessness of drinking water that is too cold; and these accidents do not inevitably cause death.

“Apart from these cases, the cure is as prompt as it is reliable. The means are so numerous and so simple that their use is restricted to Negroes. Among several reputedly skilled *Healers*, we can distinguish two in the homes of MM. S..... and M..... in the neighborhood of Saint-Pierre, and a free Mulatto, named Bocage, established in this village.

“The patient’s situation is not at all painful; absorbed by a drowsiness that he cannot overcome, he would perish in sleep. But, what is very important, the activity of the venom is not such that help is essential at the time of the injury; more

Fig. 5. Signature of Jean Louis Bonodet de Foix from a 1772 letter sent from Guadeloupe. Archives Nationales d’Outre-Mer.

than one treatment has been successful, started twelve and even fifteen hours later.

“We would confine ourselves to these details, if, for the accuracy of Natural History, we did not believe it necessary to reestablish facts that were not very exact or not sufficiently developed in the issue of October 18.

“We read there that the Snake can only bite when it is *raised*: this word is probably substituted for *coiled*⁹, used in Martinique to describe the Snake folded on itself in a spiral. Only in this state does it hurl itself forward, making a point of support with its tail, the end of which touches the ground. One strike is always followed by another, for the ease of which a Snake half-coils itself, and the extent of this configuration, always more than a third of its length, is often increased by the slope of the ground.

“The female, we continue, always has, in even numbers, from twenty to sixty young. But we do not say whether it is oviparous or viviparous, an essential distinction, perhaps, in deciding what species this Snake is. It is possible to judge this from the following. Eggs are found in the bodies of females; each egg contains two young, which, formed at the time of laying, free themselves from their envelope the moment they are deposited. Their length, at birth, is, because of the size of the egg, proportionate to that of a pigeon’s egg, in a snake of five or six feet.

“Mating has something hideous about it. Deprived of legs with which they can grasp each other, they imitate, in their union, two ropes twisted together. They remain in this position for several days. We must avoid disturbing them there. Their pursuit is then more ardent, their bite more difficult to cure.

“The common opinion, in Martinique, is that the female follows, in birthing her young, a straight line to which she returns to devour all those she finds.

“It is also assured that the Serpent does not live off of the animal on which it expends its venom; a remark all the more

⁹[Bonodet’s footnote (2)]: Nautical term, transported, just like many others in the language, to America. To moor [i.e., to fasten or tie up a ship] is put everywhere where one must say to attach. [i.e.] A woman moors the lock of her hair.

likely, as we find dead poultry, with all the signs of a Snake bite, in places where nothing would have prevented it from eating them. Its instinct to seize its prey must be like that of colubrids, water snakes¹⁰ and other reptiles which only differ from it by the lack of venomous properties. Shall we say that we attribute to the frog an empire which it cannot itself defend, and that it struggles in vain against the force which reduces it to rushing into the mouth of its enemy¹¹?

“It is a mistake to believe the bite of a large snake is more dangerous than that of a small one. On the contrary, we generally think that it is less so, because we recognize its tracks more easily. Whatever the case, recovery, in either case, is neither long nor difficult.

“No animal is more timid than the Snake. Formidable when we cannot see him, his doom is certain as soon as he is visible. A tree branch, a bundle of leaves, any object, placed within its sight, engages its attention completely for all the time one needs to arm oneself. We attack it: one blow is enough to destroy it: however, after the amputation of the head, the body is subjected, for some time, to a vermicular movement. The Negroes and even the Whites eat it and assure that it is a very pleasant dish.”

EVALUATION OF ANONYMOUS (1786) AND BONODET DE FOIX (1786)

Because we do not know who wrote the *Mémoire*, we were unable to determine how much of the content was based on first-hand knowledge or adopted from information gleaned from conversations with locals. However, based on the concluding paragraph, it is likely that the author was a medical doctor and a reasonably reliable reporter of facts. The description of the snake is generally accurate and likely the product of having examined and dissected specimens of the Fer-de-Lance. However, his interpretation of things he could not observe directly reflected the (lack of) knowledge of the time. For example, he suggested that the pit organs might serve as organs of hearing. A variety of functions for the pits of pitvipers, including as “ears,” had been proposed prior this, but on the authority of La Cépède’s repetition of the *Mémoire*’s conjecture, this function gained credence in the late 18th century. Home (1804) was able to refute a role in audition but was unable to determine their true function. Leydig (1868), building on earlier research, decisively concluded that the pits

¹⁰The original is “celui des couresses, des têtes de chien.” “Couleuvre couresse” is a vernacular name for *Erythrolamprus cursor* in Martinique. “Têtes de chien” likely refers to *Boa orophias* (Linnaeus, 1758) of St. Lucia, first given this name by Du Tertre (1654, 1667), or perhaps some other Lesser Antillean boa (see Lescure et al. 2020).

¹¹Presumably a reference to “The Frogs who Desired a King” one of Aesop’s fables, which would have been familiar to contemporary readers through “Les grenouilles qui demandent un roi” in the *Fables* of Jean de la Fontaine (1621–1695), considered a classic in the time of Bonodet de Foix. In the fable the frogs wish to have their own king but are ultimately given as king a snake or heron (in Fontaine’s version) who eats them.

were sensory organs, but of unknown function. Their role as infrared receptors was not recognized until the 20th century (Noble and Schmidt 1937). Likewise, although the author accurately described the occasional presence of two or three fangs, he was certainly unaware that these were in different stages of development to replace an easily broken fang on either side of the rotating maxillae (e.g., Cundall 2002).

As a (presumed) medical practitioner, the author's knowledge that bites can be sucked with impunity was likely from experience, or more likely the experience of the local enslaved people. This observation would have been noteworthy as the distinction between poison and venom was not generally acknowledged at the time. Similarly, when describing the effects of envenomation, remedies employed, and acknowledgement that the "disease" resulting from a bite is incurable, the author appears to be speaking from personal knowledge, explicitly so when recommending a treatment protocol to ameliorate the pain of a bite.

Descriptions of the biology of the snake are also mostly correct. The statement that snakes can bite only when the body is raised and always assume this position except when moving to a new location is suggestive of sudden encounters with a snake that had been disturbed. Accounts of litter sizes, gestation period, retreat sites and diet are all confirmed (e.g., Lalung 1934; Henderson and Powell 2009), and observations of the strike involving the first third of the body, head-first ingestion, tracking the prey after it has been bitten, and postprandial torpor are typical for pitvipers. Even the observation that a Fer-de-Lance died after ingesting an opossum may also be first-hand. Although the hypothesis that this may have been because the snake was poisoned by the prey is incorrect, it is not unreasonable in the context of 18th century knowledge. Indeed, only with respect to the comments about equal and even numbers of gray and yellow neonates and that digestion appears to be via putrefaction, resulting in an unbearable odor, is the author off base. This is unsurprising, as even a keen but casual observer would be unlikely to witness parturition or the immediate aftermath of a large meal. Thus, these are certainly based on hearsay. Overall, the reporting of the author of the *Mémoire* strongly suggests that he was someone with medical training, who probably spent a period of years on Martinique, likely treating enslaved people on plantations, which would have given him opportunities to observe not only the snakes, but the failures of folk remedies.

Bonodet de Foix, in his *Lettre*, clearly wrote from some experience as well, although his disagreement with the author of the *Mémoire* regarding the efficacy of means used to treat snakebites seems to be motivated to a considerable degree by a concern that inhabitants will leave and visitors and immigrants will avoid Martinique, rather than by a sincere belief that "curing" a bite is both simple and reliable. Although as he states, and as is consistent with his known history, Bonodet de Foix had been resident for a long time in Martinique and had traveled widely on the island, he was a lawyer who argued cases before the Sovereign Council and

would not have been expected to have the personal familiarity with venomous snakes that a medical doctor practicing on plantations would. Nonetheless, some of his comments, such as those about the young freeing themselves from the embryonic membranes and of the entwining mating pair, may be based on observation. His belief that raised posture of snakes reported in the *Mémoire* actually referred to coiled snakes may also be correct (although as we noted, there is also a plausible explanation for the first interpretation). However, he repeated some of the same falsehoods the anonymous author of the *Mémoire* and introduced additional ones. Many of Bonodet de Foix's statements reflect locally prevalent beliefs that play into the general loathing of these serpents that was (and maybe still is) true of most Martiniquais. The fetid odor they exhale, that a female returns to devour her young, and that "mating has something hideous about it" all speak to this. Indeed, while the author of the *Mémoire* was relatively dispassionate, Bonodet de Foix's representation of the snake was both more pejorative and more dismissive. While he rightly notes that the Fer-de-Lance can be easily dispatched by a well-aimed blow, it is in the context of the snake being timid. The letter ends with the claim that the snake can be a "very pleasant dish," perhaps the ultimate indication that far from being a serious threat (especially to white colonists) it can not only be vanquished, but consumed.

CONCLUSIONS

La Cépède (1789) explicitly cited the *Mémoire* four times and the *Lettre* three in footnotes in the account of the Fer-de-Lance in *Histoire Naturelle des Serpens*, but their influence can be seen throughout the account. He accepted most of what both authors reported, presenting their contradictory views on the prospect for a snakebite cure, although he accepted Bonodet de Foix's interpretation of the strike of the Fer-de-Lance starting from a coiled, rather than raised, position. Parts of La Cépède's text, such as that on anatomy, were informed by his own observation of specimens, and there are elements from Rochefort (1667) and from Badier's communications, but most of the natural history data, as well as that on treatments and the venom itself stem from the two papers translated here.

It is no surprise that La Cépède's text so strongly influenced the literature on the Fer-de-Lance for the next hundred years. La Cépède was well-respected and associated with the Jardin du Roy (later Muséum d'Histoire Naturelle, then Muséum National d'Histoire Naturelle) in Paris, the most famous and important natural history collection of its time (Fischer 1977; Hallermann 2006). His *Histoire Naturelle* was authoritative and widely available and accessible to the educated public. It was reissued and reprinted again and again through at least 1878 (Adler 1989, 2014) and, although the plates were quite different in most 19th century editions, the text remained largely unaltered. Because the two publications in the *Nouvelles de la République* were so important

for informing La Cépède, the promulgation of his *Histoire Naturelle des Serpens*, both via a century of new editions, and through the many derivative works that relied on it, resulted in their preternaturally long “life.” The *Nouvelles de la République des Lettres et des Arts* had ceased to exist even before La Cépède’s book was published, and its weekly appearance led to the journal’s impermanence, being seen more as a newsletter for the society it represented than as a periodical outlet for important original works.

Because La Cépède cited Bonodet de Foix and the anonymous *Mémoire*, those works that followed cited them too (Bechstein 1801; Latreille in Sonnini and Latreille 1801; Duchesne 1801; Daudin 1803; Gmelin 1806, 1811), or even if they did not, they still passed on their information. It was not until well into the 19th century, when the influence of La Cépède waned and a more scientific herpetology was in its ascendancy (Lescure and David 2007, 2008), that significant new information about the natural history and medical aspects of the Fer-de-Lance became available (e.g., Moreau de Jonnés 1816; Blot 1823; Guyon 1834; Rufz 1845a, 1845b, 1860), and the trend of repeating the received wisdom about the Fer-de-Lance began to fade. Even then, however, many authors continued to draw on *Histoire Naturelle des Serpens* and to cite Bonodet de Foix (Lenz 1843, 1852a, 1852b, 1864, 1870, 1878; Laboulbène 1869; Brehm 1869, 1878; Steger 1870), although, by this time, confusion over the fact that the *Mémoire* and the *Lettre* were different sources was common and Bonodet de Foix was generally cited for statements from both papers.

In the 20th century and beyond, when rigorously collected and vetted information about *Bothrops lanceolatus* became more plentiful (see Wittenberg et al., submitted), citations to the papers in *Nouvelles de la République des Lettres et des Arts* essentially vanished (Lalung 1934; Dewynter et al. 2023) and the contributions (factual or fanciful) of an unknown physician and an unremarkable colonial lawyer to the knowledge of one of the world’s most iconic snakes were all but forgotten. We hope that this contribution has demonstrated how “pulling at the thread” of bibliographic minutiae has provided some insight as to how sources so obscure played such a significant role in influencing how the world viewed the Fer-de-Lance in the century following the French Revolution.

ACKNOWLEDGEMENTS

We thank Patrick David for his assistance in interpreting some of the early documents pertaining to the life and career of Bonodet de Foix. Jean Lescure, Patrick David and Thierry Frétey provided useful comments and corrections and helped to improve the manuscript. We also thank the staff of the Princeton University Library and Special Collections for facilitating access to the 18th century publications discussed in this paper.

REFERENCES

- Anonymous. 1786. [Le serpent de la Martinique]. *Nouvelles de la République des Lettres et des Arts* 7(42):461–462.
- Anonymous [International Commission on Zoological Nomenclature]. 1987. Opinion 1463. De Lacépède, 1788–1789, *Histoire Naturelle des Serpens* and later editions: rejected as a non-bionominal work. *Bulletin of zoological Nomenclature*, 44:265–267.
- Adler, K. 1989. Herpetologists of the past. Pp. 5–141 in Adler, K. (ed.), *Contributions to the History of Herpetology*. Contributions to Herpetology, Number 5. Society for the Study of Amphibians and Reptiles, Oxford, Ohio.
- Adler, K. 2014. *Contributions to the History of Herpetology, Volume 1 (revised and expanded)*. Contributions to Herpetology, Number 5. Society for the Study of Amphibians and Reptiles, Ithaca. iv + 172 + 96 pp.
- Archives Nationales d’Outre-Mer. Secrétariat d’Etat à la Marine. Personnel colonial ancien — Lettres A à D. [Bonodet, procureur du Roi à la Martinique]. COL E40, ark:/61561/up424jdllld.
- Bauer, A. M. and R. Powell. Submitted. Conservation of *Coluber lanceolatus* as the valid name of the Martinique Fer de Lance (no matter who its author is). *Bionomina*.
- Bechstein, J. M. 1801. *Herrn de La Cepede’s Naturgeschichte der Amphibien oder der eyerlegenden vierfüßigen Thiere und der Schlangen. Eine Fortsetzung von Buffon’s Naturgeschichte aus dem Französischen übersetzt und mit Anmerkungen und Zusätzen versehen. Dritter Band*. Verlage des Industrie Comptoir’s, Weimar. xxvi + 454 pp., 30 plates.
- Blot, J.-C. 1823. *Sur la Morsure de la Vipère Fer-de-lance*. Dissertation No 106. Présentée et soutenue à la Faculté de Médecine de Paris, le 8 août 1823, pour obtenir le grade de Docteur en médecine. L’Imprimerie de Didot le Jeune, Paris. 35 pp.
- Bonnaterre, P.-J. 1790. Introduction. Pp. vii–xliv and Ophiologie. Pp. 1–76, pls. 37–42 in *Tableau Encyclopédique et Méthodique des Trois Règnes de la Nature. Ophiologie*. Première Livraison, Troisième Partie. Panckoucke, Paris.
- Bonodet de Foix, [J. L.] 1786. [Sur la serpent de la Martinique]. *Nouvelles de la République des Lettres et des Arts* 7(47):505–506.
- Brehm, A. E. 1869. *Illustriertes Thierleben. Eine allgemeine Kunde des Thierreichs. Fünfter Band. Kriechthiere, Lurche und Fische. Dritte Abtheilung. Kriechthiere*. Verlag des Bibliographischen Instituts, Hildburghausen. [vi] + 350 pp., 7 pls.
- Brehm, A. E. 1878. *Brehms Thierleben. Allgemeine Kunde des Thierreichs. Zweite umgearbeitete und vermehrte Auflage. Siebenter Band. Dritte Abtheilung — Kriechthiere, Lurche und Fische. Erster Band. Die Kriechthiere und Lurche von Dr. A. E. Brehm*. Verlag des Bibliographischen Instituts, Leipzig. xiv + 673 pp., 16 pls.
- Bruneau-Latouche, E. 1996. Les familles Crassous et Crassous de Médeuil. *Généalogie et Histoire de la Caraïbe Bulletin* 88:1822.
- Clifford, J., T. Clifford, P. Clerc, B. Rossignol and P. Rossignol. 2011. Familles de Suze, Lejeune et de Flavigny (La Grenade, Martinique et Sainte-Lucie). *Généalogie et Histoire de la Caraïbe* 2011, Article 17.
- Cundall, D. 2002. Envenomation strategies, head form, and feeding ecology in vipers. Pp. 148–161 in Schuett, G., Höggren, W. M., Douglas, M. E., and Greene, H. W. (eds.), *Biology of the Vipers*. Eagle Mountain Publishing, Eagle Mountain, Utah.
- Daudin, F. M. 1803. *Histoire Naturelle Générale et Particulière des Reptiles; Ouvrage faisant suite aux Œuvres de Leclerc de Buffon, et partie du Cours complet d’Histoire naturelle rédigé par C. S.*

- Sonnini, membre de plusieurs Sociétés savantes. Tome sixième. F. Dufart, Paris. 447 pp., pls. LXXI–LXXX.
- Desportes, P. 1770. *Histoire des Maladies de S. Domingue, Tome Premier*. Chez Lejay, Paris. [4] + 330 pp.
- Dewynter, M., B. Angin, K. Questel, O. Sculfort, E. A. Courtois, and T. Frétey. 2023. Les amphibiens et les reptiles de la Martinique: identification, répartition et bibliographie. *Herp me!* 7:1–70.
- Dubois, A., Frétey, T., Lorvelec, O. & Ohler, A. 2021. The nomenclatural status of the amphibian and reptile nomina introduced by La Cépède in his *Histoire Naturelle des Quadrupèdes Ovipares et des Serpens*, with comments on various questions of zoological nomenclature. *Bionomina* 23:1–180.
- [Duchesne, H.G.] (D ***), ed. An IX [1801]. “Serpens.” Pp. 73–76 in *Dictionnaire de l’Industrie, ou Collection Raisonnée des Procédés utile dans les Sciences et dans les Arts. Troisième Édition. Tome Sixième*. Poignée, Calixte Volland and Billois, Paris.
- Du Tertre, J.-B. 1654. *Histoire Generale des isles de S. Christophe, de la Guadeloupe, de la Martinique, et autres dans l’Amérique. Où l’on verra l’établissement de Colonies Françaises, dans ces Isles; leurs guerres Civiles & Estrangeres, & tout ce qui se passe dans les voyages & retours des Indes. Comme aussi plusieurs belles particularitez des Antilles de l’Amerique. Une description generale de l’Isle de la Guadeloupe: de tous ses Mineraux, de ses Pierreries, de ses Riuieres, Fontaines & Estangs: & de tous ses Plantes. De plus, la description de tous les Animaux de la Mer, de l’Air; & de la Terre: & un Traité fort ample des Moeurs des Sauvages du pays, de l’Estat de la Colonie Française, & des Esclaves, tant Mores, que Sauvages*. Jacques Langlois et Emmanuel Langlois, Paris. (21) + 481 + (7) pp.
- Du Tertre, J.-B. 1667. *Histoire générale des Antilles habitées par les François. Tome II. Contenant l’Histoire Naturelle*. Chez Thomas Jolly, Paris, France. (22) + 539 pp.
- Fischer, J. L. 1977. Lacépède (1756–1825), l’homme et son œuvre herpétologique. *Bulletin de la Société zoologique de France* 27:479–485. [= *Bulletin de la Société herpétologique de France* 7:479–485].
- Gmelin, J.F. 1806. *Allgemeine Geschichte der thierischen und mineralischen Gifte*. Friedrich August Knick, Erfurt. viii + 391 pp.
- Gmelin, J.F. 1811. *Allgemeine Geschichte der thierischen und mineralischen Gifte*. Johann Karl Müller, Erfurt. viii + 391 pp.
- Guénot, H. 1981. La Blancherie (1751–1811), la Correspondance générale et les Nouvelles de la République des Lettres et des Arts. *Mémoire de Maîtrise*, Université de Paris I.
- Guénot, H. 1985. La Correspondance générale pour les Sciences et les Arts de Pahin de La Blancherie (1779–1788). *Cahiers Haut-Marnais*, 162:49–61.
- Guénot, H. 1988. Les lecteurs des *Nouvelles de la république des lettres et des arts*. Pp. 73–88 in Bots, H. (ed.), *La Diffusion et la Lecture des Journaux de Langue Française sous l’Ancien Régime*. Holland University Press, Amsterdam.
- Guyon, J.-L.-G. 1834. *Des accidens produits dans les trois premières classes des animaux vertébrés, et particulièrement chez l’homme, par le venin de la vipère fer-de-lance*. Thèse présentée et publiquement soutenue à la faculté de Médecine de Montpellier. Imprimerie de X. Jullien. Montpellier. x + 72 pp. + 1 table.
- Hallermann, J. 2006. Die von Lacépède (1756–1825) in die Herpetologie eingeführten Taxa und ihr Schicksal. *Sekretär* 6(2):26–29.
- Henderson, R. W. and R. Powell. 2009. *Natural History of West Indian Reptiles and Amphibians*. University Press of Florida, Gainesville. xxiv + 496 pp.
- Home, E. in P. Russell and E. Home. 1804. Observations on the orifices found in certain poisonous snakes, situated between the nostril and the eye [by Patrick Russell, M.D. F.R.S.] With some remarks on the structure of those orifices; and the description of a bag connected with the eye, met with in the same snakes [by Everard Home, Esq. F.R.S.]. *Philosophical Transactions of the Royal Society of London* 94(1):70–76, pl. III.
- Labat, J.-B. 1722a. *Nouveau Voyage aux Isles de l’Amérique, contenant l’Histoire Naturelle de ces Pays, l’Origine, les Mœurs, la Religion & le Gouvernement des Habitans anciens & modernes. Les Guerres & les Evenemens singuliers qui y sont arrivez pendant le séjour que l’Auteur y a fait. Le Commerce & les Manufactures qui y sont établies, & les moyens de les augmenter. Avec une Description exacte & curieuse de toutes ces Isles. Tome quatrième*. Chez Guillaume Cavelier, Paris. vi + 558, 13 pls., 3 maps.
- Labat, J.-B. 1722b. *Nouveau Voyage aux Isles de l’Amérique, contenant l’Histoire Naturelle de ces Pays, l’Origine, les Mœurs, la Religion & le Gouvernement des Habitans anciens & modernes. Les Guerres & les Evenemens singuliers qui y sont arrivez pendant le séjour que l’Auteur y a fait. Le Commerce & les Manufactures qui y sont établies, & les moyens de les augmenter. Avec une Description exacte & curieuse de toutes ces Isles. Tome sixième*. Chez Pierre-François Giffart, Paris. vi + 514 + [14] pp., 9 pls., 1 fold-out map.
- Labat, J.-B. 1742. *Nouveau Voyage aux Isles de l’Amérique, contenant l’Histoire Naturelle de ces Pays, l’Origine, les Mœurs, la Religion & le Gouvernement des Habitans anciens & modernes. Les Guerres & les Evenemens singuliers qui y sont arrivez pendant le séjour que l’Auteur y a fait. Tome quatrième*. Chez Ch. J. B. Delespine, Paris. [2] + 533 pp., 1 plate. [an identical edition listing Chez Theodore le Gras, Paris, as the publisher was also published in 1742].
- Laboulbène, A. 1869. *Bothrops*. Pp. 163–174 in A. Dechambre, ed. *Dictionnaire Encyclopédique des Sciences Médicales. Tome dixième BLE — BRO*. Victor Masson et Fils, P. Asselin, Paris. [iv] + 772 pp.
- La Cépède, [B. G. E.] de. 1789. *Histoire Naturelle des Serpens. Tome second*. Hôtel de Thou, Paris. 20 + 144 + 527 pp, 22 pls., 1 folding table.
- Lalung, H. de 1934. *Le Serpent de la Martinique. Sa Légende, ses Mœurs, ses Ennemis. Comment les Caraïbes et les Nègres Soignaient ses Piqures. Essai de Médecine Rétrospective*. Laboratoires Corbière, Paris, France. 77 pp., 1 table.
- Lenz, H.O. 1843. *Gemeinnützige Naturgeschichte. Dritter Band: Amphibien. Fische. Weichthiere. Kerbthiere. Pflanzenthier. Zweite, sehr veränderte Ausgabe*. Beckersche Buchhandlung, Gotha. vi + 464, 7 pls.
- Lenz, H.O. 1852a. *Gemeinnützige Naturgeschichte. Dritter Band: Amphibien. Fische. Kerbthiere. Würmer. Dritte, verbesserte Ausgabe*. Becker’sche Buchhandlung, Gotha. viii + 518, 8 pls.
- Lenz, H.O. 1852b. Zur Naturgeschichte der Schlangen. *Europa. Chronik der gebildeten Welt* 1852(54):425–429.
- Lenz, H.O. 1864. *Gemeinnützige Naturgeschichte. Dritter Band: Amphibien. Fische. Kerbthiere. Würmer. Vierte, verbesserte Ausgabe*. Becker’sche Buchhandlung, Gotha. viii + 480 pp., 8 pls.
- Lenz, H. O. 1870. *Schlangen und Schlangenfeinde. Der Schlangenkunde zweite sehr veränderte Auflage*. Verlag von E. F. Thienemann’s Hofbuchhandlung, Gotha. iv + 287 pp., 12 pls.
- Lenz, H.O. 1878. *Gemeinnützige Naturgeschichte. Dritter Band: Die Reptilien, Amphibien, Fische wirbellosen Thiere. Fünfte Auf-*

- lage, O. Burbach, ed. E. F. Thienemann's Hofbuchhandlung, Gotha. [xiv] + 688, 12 pls.
- Lescure, J. and P. David. 2007. The birth and infancy of herpetology. Part. 1. From Aristotle to Linnaeus. *Bibliotheca Herpetologica* 7(1):17–27.
- Lescure, J. and P. David. 2008. The birth and infancy of herpetology. Part. 2. From natural to modern classifications. *Bibliotheca Herpetologica* 7(2):22–32.
- Lescure, J., C. Bochaton, M. Breuil, I. Ineich, J.-C. de Massary, and N. Vidal. 2020. Liste taxinomique des serpents des Petites Antilles. *Bulletin de la Société Herpétologique de France* 174:59–92.
- Leydig, F. 1868. Ueber Organe eines sechsten Sinnes. Zugleich als Beitrag zur Kenntniss des feineren Baues der Haut bei Amphibien und Reptilien. *Verhandlungen der Kaiserlichen Leopoldino-Carolinischen deutschen Akademie der Naturforscher* 34(5):[i–iv] + 1–108, 5 pls.
- Linnaeus, C. 1758. *Systema Naturae per regna tria naturae, secundum classes, ordines, genera, species, cum characteribus, differentiis, synonymis, locis*. Editio decima, reformata. Tomus 1. Laurentii Salvii, Holmiae [Stockholm]. [iv] + 824.
- McClellan, J.E., III and F. Regourd. 2002. The colonial machine: French science and colonization in the Ancien Régime. *Osiris* 15:31–50.
- McDiarmid, R. W., J. A. Campbell, and T. A. Touré. 1999. *Snake Species of the World. A Taxonomic and Geographic Reference*. Volume 1. The Herpetologists' League, Washington, D. C. xi + 511 pp.
- Moreau de Jonnés, A. 1816. *Monographie du Trigonocéphale des Antilles, ou Grande Vipère fer-de-lance de la Martinique; lue à l'Académie Royale des Sciences, dans sa séance du 5 août 1816*. Imprimerie de Migneret, Imprimeur du Journal de Médecine, Paris. 42 pp.
- Noble, G. K., and A. Schmidt. 1937. The structure and function of the facial and labial pits of snakes. *Proceedings of the American Philosophical Society* 77:263–288.
- Pietsch, T. 2017. *Charles Plumier (1646–1704) and His Drawings of French and Caribbean Fishes/Charles Plumier (1646–1704) et Ses Dessins de Poissons de France et des Antilles*. Publications Scientifiques du Muséum National d'Histoire Naturelle, Paris. 408 pp.
- Rocheftort, C. de. 1658. Livre Premier Comprenant l'Histoire Naturelle. Pp. 1–262 in *Histoire naturelle et morale des Antilles de l'Amérique. Enrichie de plusieurs belles figures des Raretés les plus considerables qui y font d'écrites. Avec un Vocabulaire Caribbe*. Arnould Leers, Rotterdam. Frontispiece, [14] + 527 + [12] pp., 1 portrait.
- [Rocheftort, C. de]. 1666. The history of the Caribby-Islands, viz. Barbados, S^t Christophers, S^t Vincents, Martinico, Dominico, Barbouthos, Monserrat, Mevis, Antego, &c. in all XXVIII. In two books. The first containing the natural; the second, the moral history of those islands. Illustrated with several pieces of sculpture, representing the most considerable rarities therein described. With a Caribbian-vocabulary. Rendered into English by John Davies of Kidwelly. Printed by J. M. for Thomas Dring and John Starkey, London. [6] + 351 + [15] pp. [translation of Rocheftort 1658].
- Rocheftort, C. de. 1667. *Histoire Naturelle des Iles Antilles de l'Amérique. Tome Premier*. Chez Christofle Fourmy, Lyon. [56] + 566 pp. + 1 plate.
- Rossignol, B. and P. Rossignol. 1987. Répertoire du Conseil Souverain de la Guadeloupe. Registres d'Enregistrement Serie IB Conservés aux Archives de la Guadeloupe. Centre de Généalogie et d'Histoire des Isles d'Amérique Dossier N° 5, Paris. 13 pp.
- Rufz, E. 1845a. *Enquête sur le serpent. Extrait du Journal les Antilles. Imprimerie de Carles, Saint-Pierre, Martinique*. 151 pp. [reprinted from the 1843 serial in *Les Antilles. Commerce, Agriculture, Marine, Littérature, Religion, Annonces et Avis Divers*; original not seen by authors].
- Rufz. 1845b. *The Serpent of Martinique and St. Lucia* [translation from *Les Antilles*]. Simmond's Colonial Magazine and Foreign Miscellany. 6:309–316, 409–417 [apparently never completed].
- Rufz, E. 1860 (“1859”). *Enquête sur le serpent de la Martinique (vipère fer-de-lance, Bothrops lanceolé etc.)*. Seconde édition. Chez Germer Bailliére, Paris. xix + 402 pp., 3 pls.
- Sonnini, C. S. and P. A. Latreille. 1801. *Histoire naturelle des reptiles, avec figures dessinées d'après nature. Tome III. Seconde Partie, Serpens*. Deterville, Paris. (iv) + 335 pp., 6 pls.
- Steger, F. (ed.). 1870. Die Geitzel von Martinique. *Europa. Chronik der gebildeten Welt* 1870(9): columns 281–286.
- Wallach, V., K. L. Williams, and J. Boundy. 2014. *Snakes of the World: A Catalogue of Living and Extinct Species*. CRC Press/Taylor and Francis, Boca Raton. xxvii + 1209 pp.
- Wittenberg, R. D., M. Dewynter, A. M. Bauer, and R. Powell. (submitted). *Bothrops lanceolatus*. *Catalogue of American Amphibians and Reptiles*.

We suggest the following format for citing this article:

Bauer, A. M., R. Powell and A. H. Griffing. 2024. Two Largely Forgotten Early Sources on the Fer-de-Lance of Martinique, *Bothrops lanceolatus*. *Bibliotheca Herpetologica* 18(5):60–70.



The Hermit Naturalist, A Nearly Forgotten Snake Story

C. Kenneth Dodd, Jr.

5222 N.W. 56th Court, Gainesville, Florida 32653 USA, terrapene600@gmail.com

In 1899, a writer named Fred. Alexander Lucas¹ published a short book that told the tale of a lonely hermit living on an island in the Delaware River with his attendant Petro, both of whom had immigrated from Sicily, and dog Pluto. One frosty autumn morning in 1893, the story goes, the narrator, identified only as Fritz, was fishing on the river when he saw a man fall into the river after the man's line became tangled in branches. The narrator quickly rows to the man in the water and pulls him into his boat. They retire to the man's cabin on the nearby island to dry off, whereupon the man, the Old Hermit, shows him around and begins to recount his tale. The cabin is filled with natural history and archeological items and scholarly books. The Old Hermit, identified as "the Count," and Petro live a quiet life of self-sufficiency away from the city and noisy countryside. Through multiple visits, Fritz learns more about the Count's life.

In Italy, the Count was well off living in a fine home with a beautiful young daughter. He spent his days rambling in the countryside studying natural history. Although a widower, he lived a happy life until one day, returning from his nature hike, he found his daughter was missing. Despite years of searching and substantial reward offerings, his daughter was not found, having been abducted by brigands. He discovered that one of the brigands had sailed for America with his young captive. Determined to find his daughter, he came to America in search of her, but without success. In quiet desperation, he had settled on this remote island with Petro in hopes of one day resuming his search. This story is recounted over the first 27 pages of Lucas' book. And this is when *The Hermit Naturalist* turns to snakes.

Chapter 2 (pp. 28 to 72) is devoted entirely to describing the life histories of snakes: how they live, their senses, how they feed, shedding, defensive behavior, breeding, hibernation, and the myth of snake charming. Chapter 3 (pp. 73 to 95) is devoted to the life history of local snakes: garter snakes, water snakes, spreading adder (hognose snake), black snake, pine snake, chain snake (kingsnake), milk snake, fox snake, summer green snake, ring-necked snake, De Kay's brown snake, red-bellied snake, and grass snake. The life history of these species is described by the Count to Fritz, but with little direct connection to the Hermit's life story; it is strictly snake biology. For 1899, the information is remarkably accurate and strictly within the realm of knowledge at that time. The source of the information is not provided. There were no summaries of snake biology available for New

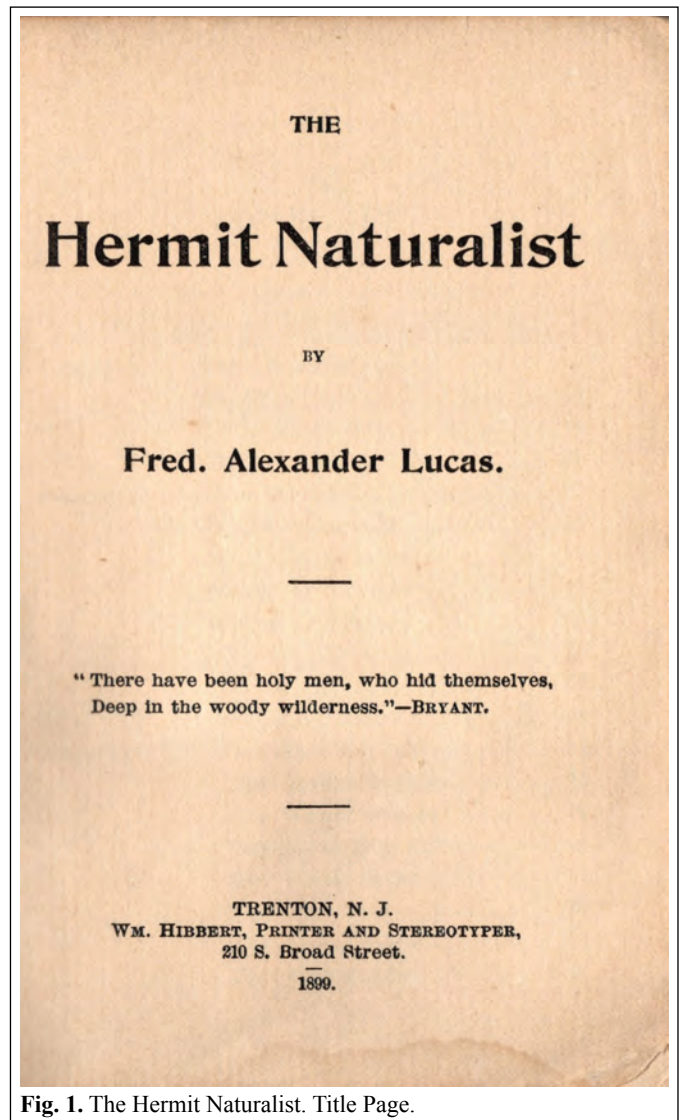


Fig. 1. *The Hermit Naturalist*. Title Page.

Jersey and Pennsylvania in the late 1890s, and an examination of DeKay (1842), Hopley (1882), Abbott (1888), and the observations of Harold C. Bumpus published in *Natural History Notes* (Bell and LeDuc, 2024) offer no clues as to the source of the Count's stories, except perhaps for general aspects of natural history, such as debunking claims that snakes "charm" their prey.

Chapter 4 (pp. 96 to 121) provides a happy ending to the Hermit's quest. On a natural history ramble through the forest the following spring, Fritz stumbles across a beautiful young

| CONTENTS. | |
|--|-------|
| | PAGE. |
| CHAPTER I.—The old hermit..... | 5 |
| His hermitage..... | 10 |
| His island retreat..... | 18 |
| His lost idol..... | 23 |
| CHAPTER II.—The life habits of snakes..... | 28 |
| Senses of snakes..... | 35 |
| How snakes feed..... | 39 |
| Shedding the skin..... | 48 |
| Modes of defense..... | 53 |
| How snakes breed..... | 59 |
| Hibernation..... | 66 |
| Do snakes charm?..... | 69 |
| CHAPTER III.—Our common snakes..... | 73 |
| The Garter snakes..... | 73 |
| The Water snakes..... | 78 |
| The Spreading adder..... | 81 |
| The Black snake..... | 84 |
| The Pine snake..... | 89 |
| The Chain snake..... | 91 |
| The Milk snake..... | 91 |

Fig. 2. The Hermit Naturalist. Contents, part 1.

girl sitting on a bench on a bluff near the sanatorium where she worked. Fritz thinks he recognizes the girl from a portrait in the Old Hermit's cabin, and comes back to see her the following day. Gaining her trust, the girl tells Fritz her story, as she was Sicilian, kidnapped by brigands and carried off to America, and abandoned when her kidnaper died. Taken in by kind people, she became a trained nurse and now worked at the sanatorium. Fritz realizes who she is and reunites her with her long-lost father. In time, Fritz marries the girl, and presumably they all live happily ever after.

Frederick Alexander Lucas (also known as Fred. A. Lucas or F.A. Lucas) (4 November 1859 – 21 April 1943; 84 years) was not a professional scientist. Census records indicate he was a clerk, and his death certificate lists him as a retired shipping clerk. Although he was born in Hastings on the Hudson, New York and died in Colwyn, Pennsylvania, he lived most of his life in Trenton, New Jersey². There, he was active in local fraternal organizations (i.e., Protector Capital City Lodge Knights and Ladies of Honor) and politics (as Election Officer in the 3rd Ward of the 4th Precinct, 1899) ac-

| 4 | |
|---------------------------------|-------|
| | PAGE. |
| CHAPTER III.—The Fox snake..... | 92 |
| The Summer Green snake... | 92 |
| The Ring-neck snake..... | 93 |
| DeKay's Brown snake..... | 94 |
| The Red Bellied snake..... | 94 |
| The Grass snake..... | 95 |
| CHAPTER IV.—A happy "find"..... | 96 |
| High Bluff..... | 97 |
| "It is she"..... | 99 |
| Glad tidings..... | 109 |
| The re-union..... | 117 |



Fig. 3. The Hermit Naturalist. Contents, part 2.

cording to various small notes in the Trenton (New Jersey) Times between 1888 and 1914. However, he was active in the Trenton Natural History Society, serving as Secretary from 1888 to 1891³. He was very involved in the publication of the Society's journal, as it was published by "Stowell and Lucas, Printers." Willard Stowell was also a member of the Society and published frequently in its short-lived journal.

The Hermit Naturalist is a small book (97 mm x 142 mm) with unlabeled brown paper covers (Figs. 1 to 3). It was published by Wm. Hibbert, Printer and Stereotyper, in Trenton, New Jersey, in 1899. There are only four tiny illustrations, one of which is of a snake. Original copies appear quite rare, but the book is available on Amazon.com in the Classic Reprint Series. Lucas also published a small booklet on social disparity (*Philosophy of Social Disparity*, 1884, MacCrellish and Quigley, Trenton. 88 pp.), a book on the natural history and stories of the Jersey shore (*Barnegat Yarns. Tales of Jersey's Popular Barnegat Bay*, 1911, Broadway Publishing, New York, 214 pp.), a poem (*Alone With Nature*, Birds and Nature Magazine, 1900, Vol. VIII(1), p. 1, which included

reference to a tortoise, bullfrog, and pond-turtles), and four short articles on snakes (below). Although hardly known today, *The Hermit Naturalist* is surely a most interesting contribution to herpetological literature.

ADDITIONAL PUBLICATIONS ON REPTILES BY FRED. ALEXANDER LUCAS

1886. Hibernation of reptiles. *Journal of the Trenton Natural History Society* 1(1):14–16.
1888. Do snakes charm? *Journal of the Trenton Natural History Society* 1(3):356–358.
1899. Snake families. *Popular Science News* 33(March):53.
1899. How snakes shed their skin. *Popular Science News* 33(September):213.

NOTES

1. Frederick Alexander Lucas may be confused with Frederic Augustus Lucas (25 March 1852–9 February 1929), as both are listed as F.A. Lucas in popular citations. Frederic Augustus Lucas was Curator-in-chief of Museums of the Brooklyn Institute of Arts and Sciences, 1904–11, and Director of the American Museum of Natural History, New York, 1911–1923, among many other posts. Although primarily known for his contributions to taxidermy, ornithology (avian reptiles), and museum science, he published 28 popular and scientific papers on fossil and extant reptiles (excluding birds) and amphibians (listed on pp. 67–68 of his autobiography [Lucas, 1933]), as well as two additional papers on preparing turtles for exhibits (p. 77). In total, Frederic Augustus Lucas published more than 400 titles as listed in his autobiography. There are no data on the internet or through Ancestry.com (census records, genealogy, Lucas family biographies, newspaper articles) to suggest family connections between Frederick Alexander Lucas (of New Jersey) and Frederic Augustus Lucas (of Massachusetts).
2. Fred. Alexander married his wife Anna in 1890. They had 3 daughters: Mildred, Thirza, and Isabela. Lucas was widowed at

the time of his death, and he is buried in Greenwood Cemetery, Trenton, New Jersey. The birth date listed above is based on his death certificate. Census listings mistakenly give it as 1860 or 1862.

3. The Trenton Natural History Society published three issues (Vol. 1, Nos. 1–3) of the *Journal of the Trenton Natural History Society* from 1886 to 1888. Two more issues (Vol. 2, Nos. 1–2) were published from 1889 to 1891 under the name *Journal of the New Jersey Natural History Society*. Other than Lucas's articles, no other papers were on reptiles or amphibians.

REFERENCES

- Abbott, Charles Conrad 1888. *Cyclopedia of Natural History, comprising Descriptions of Animal Life: Mammals, Birds, Reptiles, Batrachians, and Fishes. Their Structure, Habits, and Distribution*. A.L. Burt, New York. 620 pp. [snakes on pp. 481–502]
Bell, Christopher Jackson, and Travis James LaDuc. 2024. Hermon Carey Bumpus and the Reptiles and Batrachians of Rhode Island, with comments on other herpetological content in *Random Notes on Natural History, 1884–1886*. *Bibliotheca Herpetologica* 18(3):44–59.
De Kay, James Ellsworth. 1842. *Zoology of New York. Part III. Reptiles and Amphibia*. W & A. White and J. Visscher, Albany, New York. (2), viii, 98 pp. + 23 plates.
Hoppley, Catherine Cooper. 1882. *Snakes: Curiosities and Wonders of Serpent Life*. E.P. Dutton & Co., New York. Frontis, viii, 614 pp.
Lucas, Frederick Alexander. 1899. *The Hermit Naturalist*. Wm. Hibbert, Trenton, New Jersey, 121 pp.
Lucas, Frederic Augustus. 1933. *Fifty Years of Museum Work. Autobiography, Unpublished Papers, and Bibliography of Frederic A. Lucas, Sc. D.* American Museum of Natural History, New York, x, 81 pp.

We suggest the following format for citing this article:

- Dodd, C. K. Jr. 2024. *The Hermit Naturalist, A Nearly Forgotten Snake Story*. *Bibliotheca Herpetologica* 18(6):71–73.



Women in Herpetology — A Short Biography of Mary Hewes Hinckley

C. Kenneth Dodd, Jr.

5222 N.W. 56th Court, Gainesville, Florida 32653 USA, terrapene600@gmail.com

In the introduction to all three editions of Anna and Albert Wright's *Handbook of Frogs and Toads of the United States and Canada*, the authors dedicate the book to four women who "...have in the last half-century contributed most notably to the study of this group." Among them was Mary Hewes Hinckley (6 April 1845 – 5 June 1944; Figs. 1a, b; signature 1c), who would have been 88 when the first edition of *Frogs* was published. Relatively little information is available on this remarkable woman, despite the recognition she was accorded by the Wrights. She was honored by the American Society of Ichthyologists and Herpetologists (ASIH) at the recommendation of Albert H. Wright when the Society unanimously passed a resolution to "send our greetings to two great herpetologists—Mary H. Hinckley and Leonhard Stejneger" at the annual meeting in 1940 in Toronto (see Copeia, 1940(3):214). Here, I present some background information on Mary, discuss the importance of her observations on frogs in the late 19th Century, and identify the potential location of her one named study site.

Mary Hinckley was the first child born to the famous 19th Century Victorian painter Thomas Hewes Hinckley (1814–1896¹) and Sally Ann Bent (1814–1857) in Milton, Massachusetts, where she spent her entire life. Both the Hinckley and Bent families had long histories in New England, dating back well into the 1600s, and were firmly rooted among the patrician families in the region. Although her parents were well-connected socially, they do not appear to have been overly wealthy (Shaw, 1985), and Mary's early life would have centered around the family home and farm in what was then a rural region just northwest of the small village of Milton (Fig. 2²). Mary was 12 when her mother died a month after the birth of Mary's brother William, and the loss of her mother must have been traumatic at such a young age. Mary attended the prestigious Milton Academy Girl's School (founded in 1798³), but no other details of her education or early life are available. Although her brothers attended Harvard, she did not attend Harvard's sister school Radcliffe as did many other young women from families with similar social backgrounds. She never married.

Only scant information is available on Mary's long life, and most of that comes from her obituary⁴. She was described as "an entertaining person to meet, well versed in a great variety of subjects" and, in her later years, had very many young friends.

Mary was a student of the history of Milton and its people and published a small book based on a series of articles she authored in *The Milton Record* (Hinckley, 1908). She was a member of the Milton Historical Society and the Colonial Dames, and was active in the Milton Education Society. Her obituary also mentions that she was an authority on frogs, and that Dr. Albert Hazen Wright of Cornell had dedicated his books, in part, to her. The recognition by ASIH in 1940 was also noted.

Mary died in 1944 just past the age of 99. Her death certificate lists the cause as coronary thrombosis and arteriosclerosis. She was cremated and her ashes were scattered "under the sod" at the grave of her stepmother, Elizabeth Bass Estey (1824–1909), in the family plot at Milton Cemetery (Fig. 3).

HERPETOLOGICAL CONTRIBUTIONS

Between 1880 and 1884, Mary Hinckley published five important papers on the life history, development, and oral morphology of nine species of northeastern frogs. It is clear from the accounts that Mary Hinckley spent a great amount of time listening to and observing frogs under field conditions at a variety of locations through the years and seasons. Her five papers are highly original with a large amount of detail, especially for field biology observations in the 1880s. They report descriptions of the calls, calling dates, the location of calling individuals, mating behavior, dates of egg deposition, weather conditions, temperatures, male and female color patterns, developmental stages, tadpole behavior, and variation in the timing of metamorphosis among regional ponds. The morphology of development is presented far more comprehensively than in the descriptions and observations of her contemporaries. Mary noted the within-taxa similarity of tadpole mouthparts among the ranids, hylids, and bufonids. She recorded how the tadpoles used the different parts of the oral cavity (beak, papillae, tooth rows) in securing food, and she noticed well before modern batrachophiles that tadpole development was phenotypically plastic depending on location and water conditions. Whether a pond was deep or shallow, in direct sun or shade, affected the size of the tadpole and its developmental rate. Documenting phenotypic plasticity and its effects on fitness may not have been the direct intent of Mary's observations, but she was well on her way to understanding



Figs. 1a–b. Two portraits and signature of Mary Hewes Hinckley. Fig. 1a (left): ca. fall, 1875, photo taken at Morse’s Palace of Art, San Francisco. Mary would have been 30 at this time⁷. Fig. 1b. date and location unknown (both photos courtesy of Mike Doyle, Milton Historical Society).

how the developmental environment shapes the life history of biphasic-cycle amphibians before these variables became the subject of intensive research in the mid- to late 20th Century.

Mary Hinckley was a skilled and exacting illustrator. The papers in 1880, 1881, and 1884 have excellent illustrations and are signed by “M.H.H.” in the corner. The composite illustration demonstrating the cycle from egg to adult in Spring Peepers in 1884 is in color (Fig. 4), the others are in black and white (Figs. 5, 6). Mary must have had access to a microscope or a very strong hand lens in order to illustrate tadpole mouthparts and even individual teeth in such exquisite detail. She apparently had access to the published scientific literature, as she quotes observations by European authors from Belgium, France, Italy, and Germany in addition to Henry David Thoreau and naturalists in the United States.

All of Hinckley’s observations are reported in the first person, except for the last paragraph in her paper on the development of *Lithobates sylvaticus*, when she uses “we”

in several observations (Hinckley, 1882a). There is no indication to whom Mary might be referring. A note in the Boston Society of Natural History (BSNH) states that Samuel Garman, curator at the Museum of Comparative Zoology (MCZ) at Harvard, read the 1880 paper at the Society’s meeting, so perhaps he was her contact. The 1881 paper was also read there, but by whom is not stated. There are no specimens currently in the MCZ donated by Mary, and I have

Fig. 1c. Mary Hewes Hinckley’s signature as it appeared certifying the probate court results for the estate of her brother Thomas Lesley Hinckley. 23 August 1876.



Fig. 2. The Hinckley home at 264 Brook Road. From the back cover of Shaw (1985). Date unknown.

no record that she belonged to the BSNH. Two *Acris* sp., one *Pseudacris crucifer*, and two *Lithobates sylvaticus* were donated by Mary to the MCZ (accessioned by Garman), but they were subsequently discarded (James Hanken, personal communication). *Acris* does not occur in Massachusetts, so the identity of the specimens is unknown.

Mary Hinckley is also attributed as the author of the description of Fowler's Toad, *Bufo* (= *Anaxyrus*) *fowleri*, as a distinct species. The author attribution is based on her publication describing tadpole mouthparts (Hinckley, 1881), but the authorship was inadvertent. In her paper, she differentiated the tadpoles of *A. fowleri* from *A. americanus*, provided life history notes, and described differences in the calls between these two species. Although she referenced an earlier set of observations by the anthropologist and ichthyologist Frederic Ward Putnam (1839–1915) who first casually used the name *fowleri*, Putnam never actually published a description of Fowler's Toad or formally named it. Hence, the authorship of the name *fowleri* became Mary Hinckley's, who first published the name with a description (Myers, 1931).

HERPETOLOGICAL PUBLICATIONS BY MARY HEWES HINCKLEY

Hinckley, M.H. 1880. Notes on eggs and tadpoles of *Hyla versicolor*. Proceedings of the Boston Society of Natural History 21:104–107.

Hinckley, M.H. 1881. On some differences in the mouth structure of tadpoles of the anurous batrachians found in Milton, Mass. Proceedings of the Boston Society of Natural History 21:307–315, 1 plate. [paper abstracted in American Naturalist, 1883, 17:670–671]

Hinckley, M.H. 1882a. Notes on the development of *Rana sylvatica* LeConte. Proceedings of the Boston Society of Natural History 22:85–95.

Hinckley, M.H. 1882b. The development of the tree-toad. American Naturalist 16(8):636–639. [Reprinted in Scientific American, 1882, 14(357, supplement):5702]

Hinckley, M.H. 1884. Notes on the peeping frog, *Hyla pickeringii*, Leconte. Memoirs of the Boston Society of Natural History 3:311–318.

Thomas Hewes Hinckley, Mary's father, did many of his paintings on Naushon Island, which was owned by John M. Forbes. The families were well acquainted, as Thomas spent time on Naushon at the Forbes estate. The Forbes family was quite prominent. Today, J.M. Forbes & Co. is a private investment firm based in Boston, Massachusetts. It was founded by John Murray Forbes in 1838, the same John M. Forbes who established the Forbes estate in Milton in 1846 (see below). The engraving in Mary's paper on *Hyla versicolor* is credited to the Forbes Company, Boston. The name Forbes "constantly occurs

in our (i.e., Boston Society of Natural History) membership during the last hundred years" (Creed, 1930; p. 57). Thus, John M. Forbes might have provided the connection to the Boston Society of Natural History, where Mary's frog publications were published.

MARY'S STUDY SITES

Mary's observations were always recorded as occurring in Milton, Massachusetts, in her publications. Sites are vaguely referenced (e.g., "tadpoles of *R. catesbeiana* taken here in the Neponset River and those grown in a small pond near it"). Only in one of Mary's papers does she mention the name of a study pond, Forbes' Pond (Hinckley, 1880). According to an article in Hinckley's historical book, the large estate of John M. Forbes, a prominent Milton citizen and industrialist, was centered on Milton Hill near the junction with Adams Street. Using 1896 and 1905 plat maps of Milton, I located a parcel of land that was part of the John M. Forbes estate just east of



Fig. 3. Hinckley family plot at Milton Cemetery. Mary's ashes were buried at the grave of her stepmother, Elizabeth Bass Estey, the second stone from the right. Photo by Mike Doyle.

Milton Cemetery. A pond clearly is indicated on both maps on the property's western edge between it and the Milton Cemetery⁶. The pond is discernible through the winter trees on Google Earth (Fig. 7), and it is fed by Unquity Brook, which is labeled. The coordinates are 42.25459 N, -71.05839 W; this area currently is owned by Milton Cemetery. In a 1999 Town of Milton index plan map, the pond is labeled as Paradise Pond and is clearly demarcated as a wetland. I suspect that this pond may be the location of "Forbes' Pond."

Although Mary uses the word "pond," she was more likely than not referring to a woodland pool or small temporary pond rather than a large permanent pond, such as Turner's Pond in northwest Milton. The pond shown in the 1896 and 1905 plat maps would likely have been a shallow woodland pool, the type of wetland inhabited by Wood Frogs, Gray Treefrogs, and Spring Peepers, situated as it was in a riparian lowland adjacent to a small stream. Of course, Mary was probably working here in the years prior to 1880 when the area must have appeared quite different from today, or even from when the maps in 1896 and 1905 were published. Access to this area would have been easy for Mary, as the Hinckley home (corner of Columbine [later renamed Ridge] Road and Brook Road) was only about 2.5 km by road northwest of the section of the Forbes property on Brook Road containing the aforementioned pond. I suggest that the reference to Forbes Pond was more likely to "a pond on the Forbes estate" rather than a formally named pond, as no "Forbes' Pond" appears on any map in the area from the late 1800s to the present. Still, in 1896 a large section of the extensive Forbes estate surrounded the Hinckley property and might have contained a closer pond or woodland pool unmarked on the atlas map.

Mary seems to have recorded dates of frog calls and obtained specimens at a variety of wetlands in the vicinity of Milton, and not just at Forbes' Pond. The inclusion of American Bullfrogs, Green Frogs, Northern Leopard Frogs, and Pickerel Frogs in her analysis of tadpole mouthparts suggests access to larger wetlands within the vicinity of her home. There is another close-by pond adjacent to the Milton Academy Girl's School, which Mary attended (now just east of Stokinger Field; 42.25873 N, -71.07073 W), that could have provided individuals for study. The pond east of Stokinger Field is clearly visible on an 11 March 2024 image on Google Earth (accessed 23 May 2024). Other ponds were and are located west of Milton Cemetery, and undoubtedly



Fig. 4. Development of *Hyla pickeringii*. Hinckley (1884).

many wetlands have been lost over the more than 100 years since Mary conducted her studies in the Blue Hills and area surrounding Milton.

EPILOGUE

Why did a young woman in the 1880s from rural Massachusetts, with no apparent formal academic training, take such an interest in frogs to the point of conducting detailed studies through the years on multiple species, studies that were far advanced of her contemporaries? How did she come to write up her observations and have them published in the Boston Society of Natural History's publications? Where did she develop her advanced drawing skills that were used to



Fig. 5. The development of *Hyla versicolor*. Hinckley (1880).

illustrate tadpole mouthparts and frog life history stages? Did she conduct other natural history observations? Did she paint or illustrate or sketch other aspects of the fauna and flora of the Milton area? Why did she only publish from 1880 to 1884, then drift into relative obscurity among the scientists of her day? Did she interact with her contemporaries, and where did she get access to the references she cited? Other than the Wrights late in her life, was she recognized, encouraged,

discouraged, or supported in continuing in her education and talents? I could not find answers to these questions, and we may never know the reasons unless archival material surfaces from an unexpected source. Mary Hewes Hinckley clearly possessed a keen intellect and was insightful beyond her contemporaries, as well as an illustrator of great aptitude. She should be acknowledged as an important early contributor to North American herpetology, specifically in regard to the study of the life history and ecology of frogs.

ACKNOWLEDGEMENTS

Jim Hanken supplied information on Mary Hinckley's specimens originally deposited in the Museum of Comparative Zoology and noted that there was no correspondence from Ms. Hinckley in the Ernst Mayr Library. I especially thank Mike Doyle of the Milton Historical Society for providing copies of Mary's portraits, her obituary, the burial information and cemetery photographs, lending me his copy of Shaw (1985), and filling me in on Milton's history and the location of various important sites, particularly as to where they might have been located and who owned the land. Mike's efforts have been indispensable in assembling this brief biography. Kraig Adler, Marty Crump, and George Zug read preliminary drafts of the paper.

NOTES

1. Thomas Hewes Hinckley was born in Milton, Massachusetts, in 1814. After moving to Philadelphia at age 15, Hinckley studied art with William Mason. He was inspired by the work of Sir Edwin Henry Landseer and, while visiting Europe in 1851, the Flemish masters. He first found employment in Milton as a sign painter and later as a portraitist, but Hinckley's greatest success came from his painted representations of domestic and game animals. The appeal of Hinckley's work to hunters and farmers meant that his paintings sold quite frequently without the need to be exhibited. In 1858, however, London's Royal Academy exhibited two of Hinckley's hunting scenes. His paintings were also exhibited at the Boston Art Association (1844), the Pennsylvania Academy of the Fine Arts in Philadelphia (1848, 1855), The National Academy of Design (1846), The Boston Athenaeum (1863), the Boston Art Club (1873), the Massachusetts Charitable Mechanic Association (1874), and many others. His work is held in numerous private and museum collections including the Metropolitan Museum of

Art, The Museum of Fine Arts, Boston, and the National Museum of American Art. It is notable that the statesman Daniel Webster commissioned a painting from Thomas H. Hinckley. Shaw (1985) provides additional information on Thomas Hinckley and the Hinckley family.

2. The family home was located at 264 Brook Road. Property of St. Mary of the Hills School is now located on the site of the homestead. In her will, Mary specified that her family home be dismantled and the property sold rather than have it torn down to make way for development. She regretted the way the quiet rural life of the area was changing in the face of rapid urban expansion in Milton and the Blue Hills where she had lived her entire life (Shaw, 1985).
3. There are no alumni records available from The Milton Academy from the era when Mary attended the school, so we do not know the extent of her education there (Liz Wood, Registrar, The Milton Academy, personal communication, 28 May 2024). At the time Mary attended Milton Academy, the boys' and girls' schools were separate. Mary would have begun her higher education at age 10 and she likely would have studied algebra, geometry, religion, English (grammar, prose), Latin and Greek, rhetoric, geography, astronomy, and logic (Laura Pearle, Librarian and Archivist, The Milton Academy, personal communication, 31 May 2024). Notable modern alumni include T.S. Eliot, Buckminster Fuller, Robert F. Kennedy, Ted Kennedy, Elliott Richardson, and the singer James Taylor.
4. Obituary published 10 June 1944 in The Milton (Massachusetts) Record, p. 6.
5. Exact words, as written in the cemetery burial records.
6. The pond and locations of the John M. Forbes properties, as well as the Hinckley property, are located on Plates 3 and 12 of the 1896 and 1905 versions of the Atlas of Milton, Norfolk County, Massachusetts (available at <https://miltonlibrary.org/resources/local-history/>; Accessed 23 May 2024). At the main Forbes estate on Adams Street, now the site of the Forbes House Museum, there is not now nor has there ever been a pond known as Forbes Pond (Gwen Labbe, Forbes House Museum, personal communication, 17 May 2024).
7. Mary's brother Thomas Lesley Hinckley (b. 1849) died 1 November 1875 in Marin County, California. Mary is listed in the cemetery records as having made the burial arrangements at Woodlawn Memorial Park in San Mateo County. Letters of Administration of his will were issued to Mary on 22 December 1875. The portrait was likely made around this time. Mary may have been then living temporarily in California, as she likely had accompanied her father when he

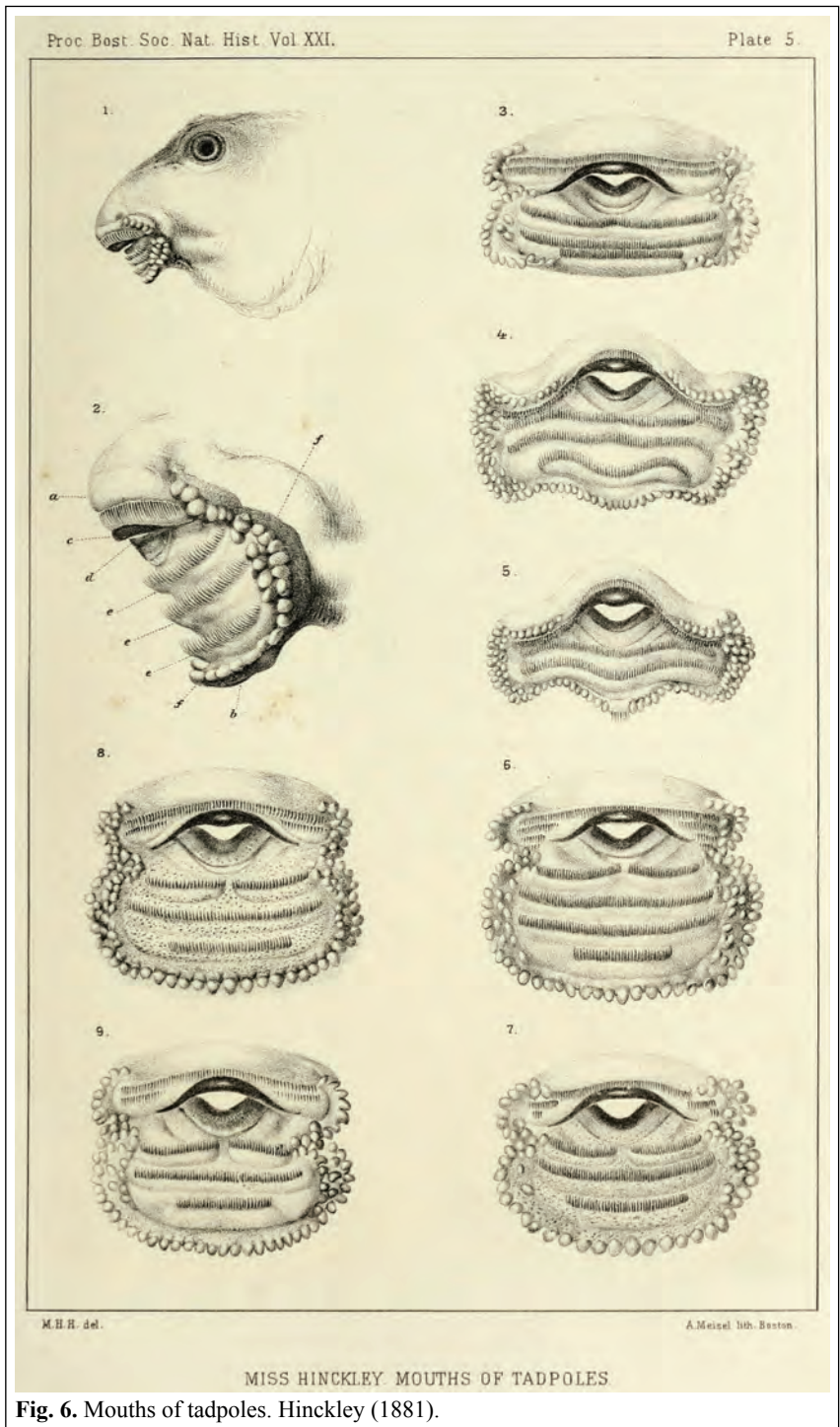


Fig. 6. Mouths of tadpoles. Hinckley (1881).

traveled there in the 1870s to paint deer and elk in their natural habitats. A third portrait of Mary, when she was about 14, is in the archives of the Milton Historical Society. The date of the portrait is unknown, but was taken at the famous Meade Brothers Studio in New York City.

REFERENCES

- Creed, P.R. (ed.). 1930. *Milestones: The Boston Society of Natural History, 1830–1930*. Boston Society of Natural History, Boston. 117 p, 39 plates.
- Hinckley, M. H. 1908. *Sketches of Early Milton*. The Milton Record, Milton, MA. 37 p.
- Myers, G.S. 1931. The original description of *Bufo fowleri* and *Bufo americanus*. *Copeia* (3):94–96.
- Shaw, M. 1985. *Thomas Hewes Hinckley – Artist to a Generation*. The Milton Public Library and Milton Historical Society, Milton, MA. 27 p.

We suggest the following format for citing this article:

Dodd, C. K. Jr. 2024. Women in Herpetology — A Short Biography of Mary Hewes Hinckley. *Bibliotheca Herpetologica* 18(7):74–80.

Errata: In the text of the biography of Mary Hewes Hinckley, I stated that Mary was the first child of Thomas Hewes Hinckley and his wife Sally Ann Bent. In fact, Mary was their second child. Their first child was Nathaniel Bent Hinckley (1843-1936). Among other aspects of his career, he served in the U.S. Navy during the American Civil War (updated on Nov. 8, 2024).



Fig. 7. Winter (11 March 2024) view of the possible location of Forbes' Pond. Two woodland pools are visible (although shown as a single pond on the 1896 and 1905 plat maps), the type of habitat used by some of the species studied by Mary Hinckley (see text). Part of the Forbes estate was located just east of these pools. Image from Google Earth (Accessed 23 May 2024).



Early Zoo Studies in Herpetology: Catherine C. Hopley and the London Zoological Gardens

Robert W. Mendyk

Department of Herpetology, Audubon Zoo, 6500 Magazine Street, New Orleans, LA 70118
Department of Herpetology, Smithsonian National Zoological Park,
3001 Connecticut Avenue NW, Washington, D.C. 20008
rmendyk@auduboninstitute.org

"You can have no idea how much there is to learn about the ways of snakes. The more knowledge one gains the more one is sensible of ignorance"—Catherine Cooper Hopley, quoted in Anonymous (1893)

It may come as a surprise to many that the first popular English-language book ever to be published on the lives and habits of snakes was authored by a woman in Victorian England¹—a period marked by sexism, misogyny, and defined societal gender roles where women were ineligible for post-secondary academic pursuits, and often excluded from participation in the natural sciences and memberships in scientific societies (e.g., Ogilvie, 1986; Creese, 1998). Yet, despite some initial surprise over the gender of its author (see Adler, 2007), Catherine Cooper Hopley's (1882a) *Snakes: Curiosities & Wonders of Serpent Life* (Fig. 1) was widely-acclaimed, receiving many positive and celebratory reviews (Fig. 2; Anonymous 1883a,b,c,d). Its literary success flew in the face of numerous publishers that had declined or would not even entertain the idea of taking the project on because of its apparent "loathsome" subject matter (Hopley, 1882a; Anonymous, 1893).

As an amateur naturalist, Hopley (1817–1911) would go on to author many additional works on herpetology including a second book titled *British Reptiles and Batrachians* (1888), as well as more than 50 articles and correspondences appearing in various journals and periodicals (see below for an annotated bibliography of her published works). Through these writings, she established herself as a leading authority on snakes in the late 19th Century and has since been recognized and celebrated as an important figure in the history of herpetology (Adler, 2007). Various aspects of her life, herpetological contributions, and impacts have been covered by Adler

¹ Although Catherine Cooper Hopley's (1882) *Snakes: Curiosities & Wonders of Serpent Life* is widely regarded as the first major tome to popularize the lives and habits of snakes, there had been previous English-language works on snakes including Edward Topsell's (1608) *The History of Four-footed Beasts, Serpents, and Insects* and Charles Owen's (1742) *An Essay Towards a Natural History of Serpents*. These works, however, tended to focus on cataloging species, were largely steeped in myth and folklore, and did not see the widespread distribution, audience or reach of Hopley's book.

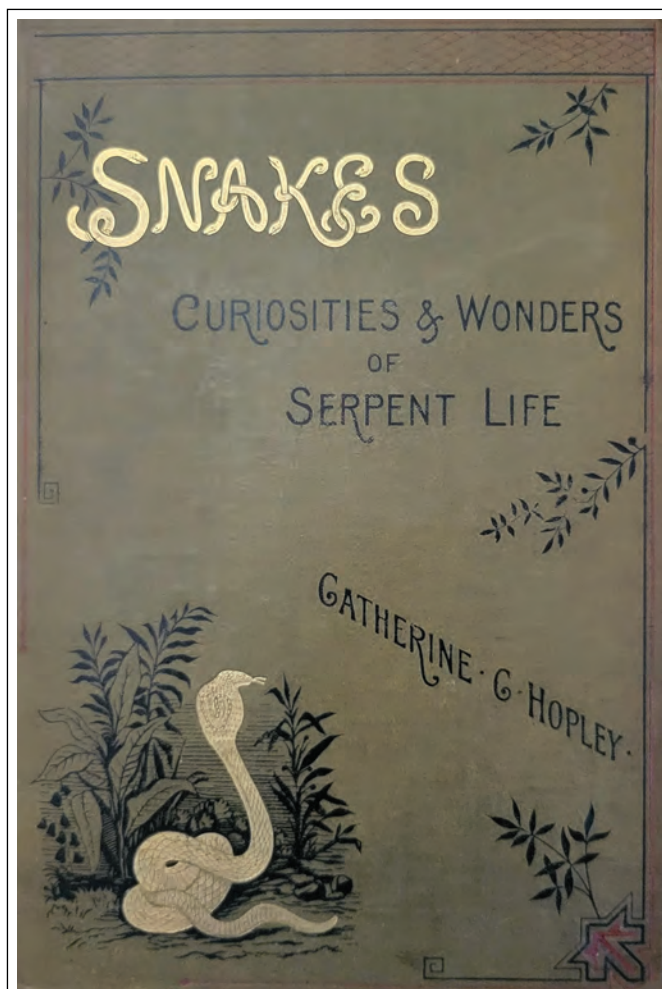


Fig. 1. Catherine Cooper Hopley's (1882a) seminal work, *Snakes: Curiosities & Wonders of Serpent Life* was the first English-language popular book on the lives and habits of snakes.

(2007), Coote (2018a,b), Murphy (2020), Dodd (2023), and others (Anonymous, 1911; Creese, 1998; Haverstock et al., 2000; Talairach, 2021).

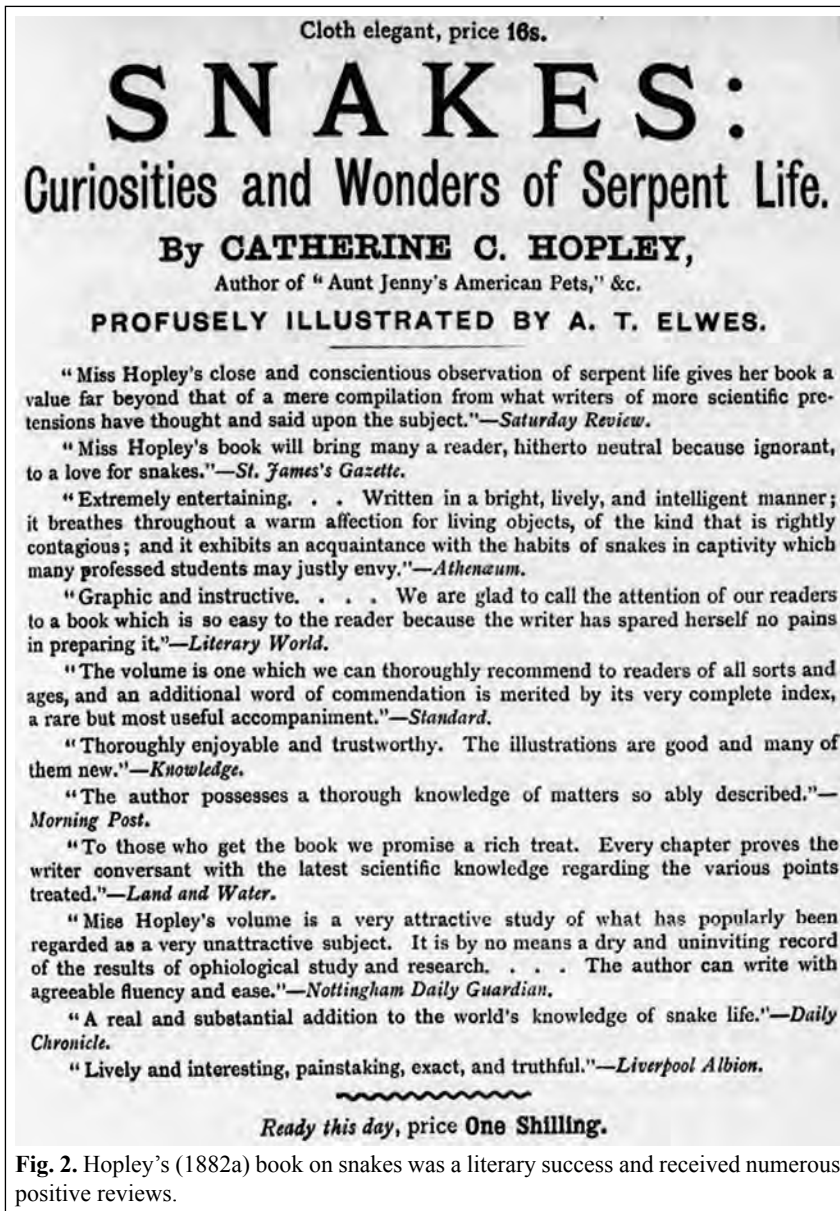


Fig. 2. Hopley's (1882a) book on snakes was a literary success and received numerous positive reviews.

In her seminal work, *Snakes: Curiosities & Wonders of Serpent Life*, Hopley (1882a) covered a broad range of topics related to the anatomy, physiology, natural history and habits of snakes, sharing insights and information gleaned from her own studies and observations of living and preserved specimens, correspondence with various contemporaries, and a thorough review of the literature. Beginning in 1872, Hopley set out to read every published work on snakes she could find and split her time between the British Museum and the London Zoological Gardens, "sitting for hours on hours in the reptile house" (Anonymous 1893). She purportedly spent so much time in the zoological gardens' reptile house (Fig. 3), which she referred to as the "Ophidarium", that she suspected some of the zoo's keeper staff were concerned that she might be there for mischievous purposes (Adler, 2007).

While some authors have reported that Hopley was employed for some time by the zoological gardens (e.g., Creese,

1998), this does not appear to be the case. Instead, it appears that she simply visited regularly, much like her contemporary and fellow amateur ophiologist Arthur Stradling who also studied the zoological gardens' snake collection (see Mendyk, 2022). At the reptile house, she befriended a long-time keeper named Holland and regularly exchanged information with the keeper staff, gaining various insights on specimens in the collection. Many of Hopley's observations and discoveries made at the zoological gardens were presented throughout her (1882a) book, which concludes with the chapter, *Notes from the Zoological Gardens*. These efforts, which spanned the course of a decade, represent some of the earliest focused, observational studies carried out on the lives and habits of snakes (as well as other reptiles) in a zoological park.

INSIGHTS AND DISCOVERIES FROM THE ZOOLOGICAL GARDENS

Snake feedings at the reptile house presented exciting opportunities to study various aspects of their anatomy, behavior, and functional morphology. Hopley kept detailed records on the lengths of time that different species fasted without food and recorded unique hunting behaviors such as bird predation by pythons, egg-eating by *Dasypeltis* (Fig. 4), and an unusual behavior observed in an *Elaphe quatuorlineata* in which multiple sparrows were captured and constricted simultaneously, then consumed in succession (Fig. 5). She took special interest in the glottis during feedings with *Haemorrhois hippocrepis*, *Bitis nasicornis*, and *Natrix helvetica*, offering descriptions of

its structure and function, which she later expanded upon in a more technical publication (Hopley, 1884). Observations on the structure and function of the snake tongue led to the discovery of lingual luring in some species which she suspected was used to attract avian prey (Hopley, 1882a); this phenomenon, which was apparently discovered independently of her contemporary Arthur Stradling around the same time (Mendyk, 2022), would not receive much attention for more than a century when the behavior was discovered in some naticrine taxa (Welsh and Lind, 2000; Hansknecht, 2008).

Many observations were made on the zoo's large King cobra (*Ophiophagus hannah*) named 'Ophio' which was acquired in 1885 as the first of its kind to be displayed at the zoological gardens. These observations included evidence of its intelligence (it was purported to be able to distinguish between individual keepers at the reptile house), ecdysis, dietary preferences, feeding habits, prey-handling behav-

iors, and venom effects on live prey (Hopley, 1882a). Hopley also observed the venom effects of the Saw-scaled viper (*Echis carinata*) and Rinkhal (*Hemachatus haemachatus*) and carried out investigations on other venomous species in the collection, such as studies on the structure, growth and function of the crotaline rattle (Hopley, 1882a, 1887a), and the dietary preferences, feeding behavior and venom effects of the first live Gila monster *Heloderma suspectum* (misidentified at the time as *H. horridum*) acquired by a European zoo, which arrived at the zoological gardens in 1882 (Hopley, 1882a,b).

Hopley also studied reproductive aspects of species that had produced offspring at the zoological gardens. For instance, she provided details on maternal egg incubation by pythons at the reptile house and other zoos (Hopley, 1893) and was the first to describe the offspring of the Asian vine snake (*Ahaetulla prasina*) which were born at the reptile house in 1885 (Hopley, 1886). Earlier, in 1881, a litter of Rhinoceros vipers (*Bitis nasicornis*) were born at the reptile house (Fig. 6), with most dying shortly thereafter. After some pleading with zoo management, she was able to acquire one of the deceased neonates and carried out a detailed study on the peculiar horn-like rostral appendage of the species (Hopley, 1882a). In addition to reproduction, Hopley also investigated aging in snakes and was likely the first person to ever address the subject when she described the effects of “senility” on a large African rock python (*Python sebae*) that had lived at the reptile house for 23 years and was believed to be in its 30s at the time of its death (Hopley, 1887b).

What appears to have been Hopley’s proudest insight gained from her studies at the zoological gardens was the discovery of moveable maxillary teeth in a specimen of the colubrid *Xenodon rhabdocephalus* that had recently arrived at the reptile house. However, because she had convinced one of the keepers to show her the snake after-hours and allow her to inspect its dentition while in hand, she was hesitant to publish the findings due to fears that the keeper would be punished should something happen to the specimen (snakes typically did not survive long in captivity at the time) (Hopley, 1882a). The discovery appears to have been overlooked by other researchers, as Boulenger (1915) would later describe the trait as a new character of the genus some 32 years later without referencing Hopley.



Fig. 3. The “ophidarium”, or reptile house of the London Zoological Gardens where Hopley conducted observational studies on the lives and habits of snakes. From: Anonymous (1849).

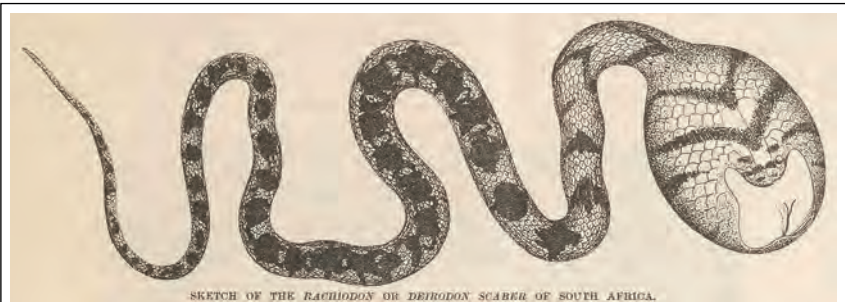


Fig. 4. *Dasypeltis* feeding on an egg, based on observations made at the London Zoological Gardens. From: Hopley (1892).

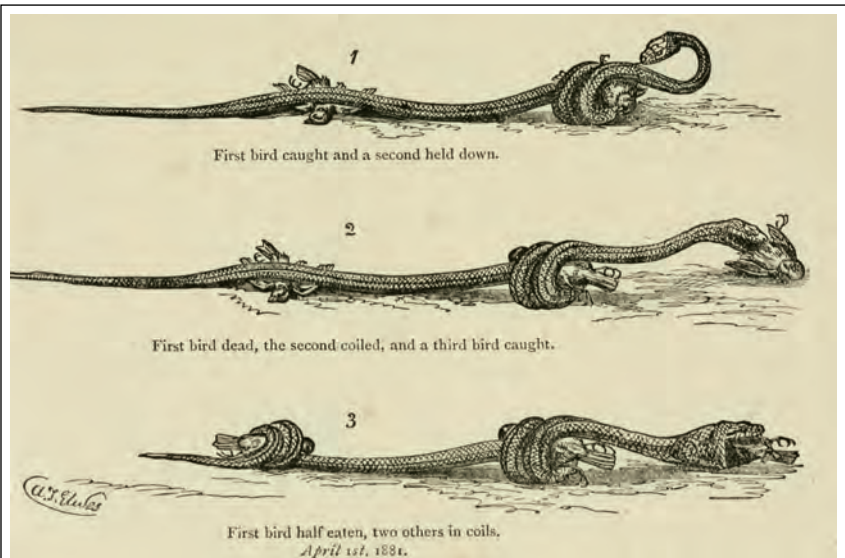


Fig. 5. Depiction of an unusual feeding behavior observed in an *Elaphe quatuorlineata* at the zoological gardens. From: Hopley (1882a).



Fig. 6. Rhinoceros viper (*Bitis nasicornis*) female and young; offspring of this species were born at the zoological gardens in 1881 and later studied by Hopley. From: Hopley (1882a).

Having overheard numerous conversations and comments by visitors to the zoological gardens' reptile house, Hopley was frustrated by the ignorance and abhorrence expressed by many towards snakes. She kept records of many of these comments, and used them to inspire and motivate some of her popular writings and correspondence:

"Friends protested—and still demand—even while I write—'How can you give your mind to such odious, loathsome, slimy creatures?' and I boldly reply, 'In the hope of inducing you to believe that they are not odious and loathsome, and especially not "slimy", but in the majority graceful, useful, beautiful, wonderful!' and I invite them to accompany me to the Zoological Gardens, and endeavour there to contemplate a reptile as they look at the other denizens of the Gardens, simply as a member of the wide family of the brute creation, appointed by the Great All-wise to live and feed and enjoy existence as much as the rest, and that have to accomplish the purpose for which they were created equally with the feathered families which we admire and—devour!" (Hopley, 1882a, p. 16)

Hopley concluded her book with great enthusiasm for the pending completion of a new reptile house at the zoological gardens which would open the following year in 1883, noting:

"With the rapid advance of ophiology comes the splendid new home for snakes which will shortly grace our Zoological Gardens; and in taking leave of my readers, I cannot offer them a kinder wish than that their visits there to observe the snakes will be productive to them of as much pleasure as has been mine to describe them". (Hopley, 1882a, p. 592)

OUTLOOK

In a time when women had very little to no involvement in the study of reptiles and amphibians (Adler, 2007, 2012, 2014), Catherine Cooper Hopley broke the mold in terms of what a naturalist and prolific contributing herpetologist (or ophiologist) was and looked like (Fig. 7). Her early efforts at the London Zoological Gardens to study the lives and habits of snakes illustrate the long-standing tradition and legacy that zoo collections have played in advancing

the field of herpetology (e.g., Rieck et al., 2001; Murphy, 2007), as well as the important role that zoological parks can play as sites of inquiry for children and other burgeoning naturalists (Talairach, 2021). These early studies on living specimens at the zoological gardens proved crucial for advancing the discipline, especially considering that field studies on reptiles and amphibians had been lacking and most investigations carried out on these groups up to that point had been limited to museum studies focused on comparative anatomy and systematics. Through her studies on the habits of living snakes and natural propensity for captivating prose, Hopley gave life to this poorly understood and often-maligned group, inspiring curiosity and fascination which ultimately helped change the ways in which they were viewed.

ACKNOWLEDGMENTS

I thank Jon Coote for sharing useful literature and for insightful discussions on Catherine C. Hopley and other early British herpetologists, Breck Bartholomew, Kenn Dodd, and Laurence Talairach for helpful comments and feedback on this manuscript and other courtesies, and the Smithsonian Institution Libraries for sourcing obscure literature.

REFERENCES

- Adler, K. 2007. *Contributions to the History of Herpetology*. Vol. 2. Society for the Study of Amphibians and Reptiles, Saint Louis. 389 p.
- Adler, K. 2012. *Contributions to the History of Herpetology*. Vol. 3. Society for the Study of Amphibians and Reptiles, Vancouver. 564 p.
- Adler, K. 2014. *Contributions to the History of Herpetology*. Vol. 1, revised and expanded. Society for the Study of Amphibians and Reptiles, Ithaca. 172 p.
- Anonymous. 1849. The new reptile house in the gardens of the Zoological Society of the Regent's Park. *The Illustrated London News*, 2 June 1849:384.
- Anonymous. 1883a. Snakes; Curiosities and Wonders of Serpent Life. By Catherine C. Hopley. *The Zoologist* Ser. 3, 7(75):142–144.
- Anonymous. 1883b. Snakes: Curiosities and Wonders of Serpent Life. *British Quarterly Review* 77:476–477.
- Anonymous. 1883c. Snakes. *Knowledge* 3:133–134.
- Anonymous. 1883d. Snakes and snake-life. *Chambers' Journal* 20(1004):186–189.
- Anonymous. 1893. Snakes! A chat with Miss Catherine C. Hopley. *The Sketch* 3:415–416.
- Anonymous. 1911. Death of Miss Hopley, "The Globe's" oldest contributor. *The Globe*, 1 May 1911:6.
- Boulenger, E. G. 1915. On a colubrid snake (*Xenodon*) with a vertically movable maxillary bone. *Proceedings of the Zoological Society of London* 85:83–85.
- Coote, J. 2018a. Catherine Cooper Hopley - Her early published papers on snakes, 1875 and 1876. Part one. *The Herptile* 43:106–119.
- Coote, J. 2018b. Catherine Cooper Hopley - Her early published papers on snakes, 1875 and 1876. Part two. *The Herptile* 44:23–33.
- Creese, M. R. S. 1998. *Ladies in the Laboratory? American and British Women in Science, 1800–1900*. The Scarecrow Press, Inc., Lanham and London. 452 p.
- Dodd Jr., C. K. 2023. Herpetology in Catherine Cooper Hopley's non-herpetological books. Last accessed: 29 March 2024.
- Hansknecht, K. A. 2008. Lingual luring by mangrove saltmarsh snakes (*Nerodia clarkii compressicauda*). *Journal of Herpetology* 42:9–15.
- Haverstock, M. S., J. M. Vance, and B. L. Meggitt. 2000. Hopley, Catherine Cooper. Pp. 425–426 in: *Artists in Ohio, 1787–1900: A Biographical Dictionary*. Kent State University Press, Kent.
- Hopley, C.C. 1882a. *Snakes: Curiosities & Wonders of Serpent Life*. Griffith and Farran, London. 614 p. [co-published by E.P. Dutton & Co., New York.]
- Hopley, C.C. 1882b. The tuberculous or warty-skinned lizard (*Hemoderma horridum*). *Knowledge* 2:299–300.
- Hopley, C.C. 1884. The glottis of snakes. *American Naturalist* 18:732–733.
- Hopley, C.C. 1886. A family of rare Java snakes. *Nature* 33:295.
- Hopley, C.C. 1887a. The rattle. *Forest and Stream* 28:512–513.
- Hopley, C.C. 1887b. An example of ophidian senility. *Forest and Stream* 28:551.
- Hopley, C.C. 1888. *British Reptiles and Batrachians*. Swan, Sonnenschein, Lowrey & Co., London. 94 p.
- Hopley, C.C. 1892. South African reptiles at home. III. Some of the snakes. *Forest and Stream* 38:495.
- Hopley, C.C. 1893. The Indian rock snake. *The Sketch* 3:671.
- Mendyk, R. W. 2022. A peculiar case of ophiomania: The herpetological pursuits of Arthur Stradling. *Bibliotheca Herpetologica* 16:14–32.



Fig. 7. Late 19th Century portrait of Catherine Cooper Hopley (1817–1911) with her pet Bowsprit tortoise (*Chersina angulata*) named “Wally” which she brought back from a trip to South Africa.

- Murphy, J. B. 2007. *Herpetological History of the Zoo and Aquarium World*. Krieger, Malabar. 327 p.
- Murphy, J. B. 2020. How it all began—herpetologists and their art throughout the ages. Part III—19th and mid-20th Centuries listing surnames D–L. *Herpetological Review* 51:651–659.
- Ogilvie, M. B. 1986. *Women in Science: Antiquity through the Nineteenth Century*. MIT Press, Cambridge. 254 p.
- Rieck, W., G. Hallmann, and W. Bischoff. 2001. *Die Geschichte der Herpetologie und Terrarienkunde im deutschsprachigen Raum*. Mertensiella 12. Deutsche Gesellschaft für Herpetologie und Terrarienkunde e.V., Rheinbach. 760 p.
- Talairach, L. 2021. Victorian menageries. Pp. 67–124 in: *Animals, Museum Culture and Children's Literature in Nineteenth-Century Britain*. Palgrave Macmillan, Cham.
- Welsh Jr., H. H., and A. J. Lind. 2000. Evidence of lingual-luring by an aquatic snake. *Journal of Herpetology* 34:67–74.

ANNOTATED BIBLIOGRAPHY OF CATHERINE COOPER HOPLEY'S PUBLISHED WORKS IN HERPETOLOGY

- Hopley, C.C. 1873. A remarkable duel. Pp. 622–627 in: A. Gatty (ed.), *Aunt Judy's Christmas Volume for 1873*. George Bell and Sons, London. [discusses the feeding behaviors of the secretary bird on snakes, describing a traveler's observations of such an interaction]
- _____. 1874. Snake destroyers. Pp. 164–170 in: A. Gatty (ed.), *Aunt Judy's Christmas Volume for 1874*. Bell and Daldy, London. [a popular children's account on snake enemies]
- _____. 1874. How snakes feed. Pp. 561–566 in: A. Gatty (ed.), *Aunt Judy's Christmas Volume for 1874*. Bell and Daldy, London. [a popular children's account on the feeding behaviors and mechanisms of snakes]
- _____. 1874. The Deirodon; or, neck-toothed snake. Pp. 626–630 in: A. Gatty (ed.), *Aunt Judy's Christmas Volume for 1874*. Bell and Daldy, London. [a popular children's account on the egg-eating snake, *Dasypeltis*]
- _____. 1874. How a snake walks. Pp. 658–662 in: A. Gatty (ed.), *Aunt Judy's Christmas Volume for 1874*. Bell and Daldy, London. [a popular children's account on snake locomotion]
- _____. 1875. Ophidians. No. I. Their manners. *Dublin University Magazine* 86:697–710. [a lengthy article that discusses misconceptions and myths about snakes, their drinking and feeding behaviors, ecdysis, tongue use, rattle use in rattlesnakes, and other topics]
- _____. 1876. Ophidians. No. II - Their attributes. *Dublin University Magazine* 87:97–107. [a lengthy article that discusses cultural traditions, depictions, and worship of snakes, victims of snakebite and ritualistic cures, snake charmers, and some observations on the zoological gardens' *Ophiophagus hannah*]
- _____. 1876. Ophidians. No. III - Their evils. *Dublin University Magazine* 87:344–359. [a lengthy article that discusses misrepresentations of venomous snakes in the literature including their venom properties and effects and remedies for venomous snakebite, as well as earlier experiments on snake venom, descriptions of the venom glands and dentition of venomous species, and an early classification system for snakes]
- _____. 1877. The history of a rattle. *Aunt Judy's Magazine* 15:527–536. [a lengthy popular account on the rattlesnake's rattle, geared towards an adolescent audience]
- _____. 1878. The calico-snake. *Science News* 1(3): 48. [briefly discusses the defensive and death-feigning behaviors of *Heterodon platirhinos*]
- _____. 1882. *Snakes: Curiosities & Wonders of Serpent Life*. Griffith and Farran, London. 614 p. [the first English-language popular book on the lives and habits of snakes; covers a broad range of topics relating to snake anatomy, physiology, behavior and natural history. Co-published by E.P. Dutton & Co., New York.]
- _____. 1882. The tuberculous or warty-skinned lizard (*Heloderma Horridum*). *Knowledge* 2:299–300. [discusses the etymology of *Heloderma*]
- _____. 1883. Snake poison. *Nature* 28:612. [discusses the lack of effects from snake venom on plants, and references prior venom studies by S. Weir Mitchell]
- _____. 1884. Snakes in Nebraska. *American Naturalist* 18:639. [briefly describes claims that several snakes were observed seeking shelter in the long mane of a horse during a flooding event]
- _____. 1884. The glottis of snakes. *American Naturalist* 18:732–733. [discusses the glottis in *Pituophis*, and describes her observations on the structure and function of the glottis in snakes at the zoological gardens]
- _____. 1884. Ophidiana, or snake gossip. *Forest and Stream* 22:65. [discusses the unique dentition and feeding habits of *Heterodon* and *Xenodon*]
- _____. 1886. A family of rare Java snakes. *Nature* 33:295. [describes reproductive aspects and the offspring of *Ahaetulla prasina* that were born at the zoological gardens]
- _____. 1886. Some pet lizards. *Chambers' Journal* Ser. 5, 3:454–458. [describes her experiences keeping several British lizard species and *Phrynosoma cornutum*]
- _____. 1886. The cobra. *The Globe*, 16 September 1886:6. [discusses cultural traditions and attitudes towards cobras, as well as hooding behavior]
- _____. 1886. "Like cures like". *Forest and Stream* 27:145. [discusses cases of self-inoculation with snake venom and its potential application]
- _____. 1886. An exceptional snake. *Forest and Stream* 27:244. [describes the feeding habits and behaviors of *Malpolon monspesulanus* at the zoological gardens and discusses the implications of its unique blend of venom and constriction]
- _____. 1887. The rattle. *Forest and Stream* 28:512–513. [discusses the evolution, structure, growth and function of the rattlesnake rattle]
- _____. 1887. An example of ophidian senility. *Forest and Stream* 28:551. [describes the physical, behavioral and health challenges associated with old age in a *Python sebae* that died at the zoological gardens after residing there for 23 years]
- _____. 1888. *British Reptiles and Batrachians*. Swan, Sonnenschein, Lowrey & Co., London. 94 p. [a comprehensive description of the native reptiles and amphibians of Britain]
- _____. 1889. The hibernation of reptiles. *Forest and Stream* 33:242–243. [describes in detail her experiences with hibernation in captive amphibians]
- _____. 1889. The hibernation of reptiles. *Forest and Stream* 33:265. [a continuation of the previous article on hibernation; describes in detail the behavioral effects of hibernation on a *Bufo bufo*]
- _____. 1889. Snakes' weapons. *Forest and Stream* 32:508. [discusses the dentition of snakes including fang breakage and replacement in vipers, and describes observations of snakes made at the zoological gardens]

- _____. 1890. New arms and legs. *The Globe*, 6 January 1890:7. [discusses the regenerative abilities of some lizards and caudates]
- _____. 1890. Can animals distinguish music? *The Globe*, 14 April 1890:3. [discusses hearing in reptiles and their purported response to music]
- _____. 1890. Do snakes like music? *Forest and Stream* 34:491. [dispels myths about snake hearing and shares observations of snakes at the zoological gardens responding to different sounds and vibrations]
- _____. 1890. Snake gossip. *Forest and Stream* 35:67. [correspondence that seeks to identify a purported “stinging snake”, and briefly discusses snake dentition]
- _____. 1891. South African snake lore. *The Globe*, 17 November 1891:6. [seeks to debunk the myths that vipers swallow their young, and that they also feed on the milk of cows]
- _____. 1892. South African reptiles at home. *Forest and Stream* 38:419. [describes the care and habits of a Bowsprit tortoise (*Chersina angulata*) that she brought back from South Africa and kept as a pet]
- _____. 1892. South African reptiles at home II. Chameleons. *Forest and Stream* 38:443. [discusses the anatomy, feeding behavior, and color-changing abilities of chameleons, and describes some aspects of their captive care]
- _____. 1892. South African reptiles at home. III. Some of the snakes. *Forest and Stream* 38:495. [describes the unique dentition and feeding behavior of *Dasypeltis*, and briefly discusses African spitting cobras]
- _____. 1892. In the land of vipers. *The Globe*, 24 March 1892:3. [describes observations and others’ reported encounters with vipers from her trip to South Africa]
- _____. 1892. In search of what is true. *The Globe*, 25 April 1892:3. [seeks to set the record straight on which is the longest species of venomous snake; also discusses others’ demonstrations with the venom spitting ability of some African cobras]
- _____. 1892. The tortoise at home. *The Globe*, 13 June 1892:3. [describes the husbandry provided for her pet Bowsprit tortoise (*Chersina angulata*)]
- _____. 1892. Puff adders in plenty. *The Globe*, 24 November 1892:3. [describes the abundance of *Bitis arietans* encountered during a trip to South Africa, with some information on their fangs and venom effects]
- _____. 1893. Tails. *The Globe*, 27 January 1893:3. [discusses tail use in snakes and lizards, including defensive tail strikes by iguanas and monitor lizards]
- _____. 1893. The Indian rock snake. *The Sketch* 3:671. [discusses maternal incubation of python eggs]
- _____. 1893. White rattlesnake. *The Globe*, 27 November 1893:6. [describes reports of white rattlesnakes in the United States; briefly mentions observing an albino kingsnake while visiting the Cincinnati Zoo in 1884]
- _____. 1893. Spitting snakes. Part I. *Forest and Stream* 40:561. [addresses claims of venom spitting in viperid snakes, including *Crotalus*]
- _____. 1893. Spitting snakes. Part II. *Forest and Stream* 41:4. [discusses venom spitting in *Hemachatus haemachatus*, and describes her observations of feeding behavior and venom effects of this species at the zoological gardens]
- _____. 1894. Our British snakes. *Science-Gossip* 1:73–75. [provides detailed descriptions of Britain’s native snakes, including some observations on them made in the zoological gardens]
- _____. 1894. Authentic snake stories. *The Globe*, 6 August 1894:3. [describes several instances of cannibalism in captive snakes maintained at the zoological gardens]
- _____. 1895. Toads and tadpoles. *The Globe*, 13 February 1895:3. [discusses the unique reproductive strategy of *Pipa pipa* and other forms of parental care in anurans]
- _____. 1895. Is it suicide? *The Globe*, 28 May 1895:3. [dispels myths and clarifies venomous snakes’ immunity to self-inflicted bites]
- _____. 1895. Fringed lizards and Co. *The Globe*, 24 June 1895:3. [provides descriptions of iguanas (*Iguana* and *Cyclura*), other lizards, and treefrogs received by the zoological gardens]
- _____. 1899. The neck-toothed snake. *The Globe*, 31 January 1899:3. [describes aspects of the biology of *Dasypeltis*, including a discussion of its feeding behavior which she observed at the zoological gardens].
- _____. 1899. A record cobra. *The Globe*, 28 June 1899:6. [discusses some local names for cobras as well as the venom effects of the Indian cobra]
- _____. 1902. How snakes eat. Pp. 258–263 in: D.S. Jordan (ed.), *A Book of Natural History*. Volume 14. Hall & Locke Co, Boston. [discusses feeding behavior and mechanisms of snakes]

We suggest the following format for citing this article:
Mendyk, R. W. 2024. Early Zoo Studies in Herpetology: Catherine C. Hopley and the London Zoological Gardens. *Bibliotheca Herpetologica* 18(8):81–87.



Jagannathan “Viji” Vijaya and the Forest Cane Turtle (*Vijayachelys silvatica*, Henderson 1912)

Simon Rouot

rouotsimon@gmail.com

Throughout the rainforests of the Western-Ghats, one of the smallest Geoemydidae turtles known today—the Forest Cane Turtle (*Vijayachelys silvatica*, Henderson 1912; Fig 1.)—can be found in Kerala, Karnataka, and Tamil Nadu in the southwest of the Indian peninsula (Deepak *et al.* 2014). This remarkable turtle is easily distinguished by several unique morphological features. The three keels that line the carapace along the vertebral and costal scutes, for example, result in the appearance of a triangular shell shape when viewed head on, due to the comparatively exaggerated vertebral scute along an otherwise flatter shell. In coloration, these turtles vary from light brown to near black, but are just as often covered in algae, making them appear green. And the head—notably distinguished by a hooked upper jaw—varies from pink to red in males, to greys, blacks, and browns marked in light pink in females along the head and eyes.

This terrestrial species lives predominantly in the leaf litter, in which it has adapted to quickly conceal itself, especially during cooler, dry months when they are difficult to detect (Kanagavel, and Raghavan, 2012). By all accounts, the Forest Cane Turtle actually “dives” into the leaf litter to avoid threats (Vasudevan *et al.* 2010). During the rainy season, specifically during periods of rainfall, however, the turtles become active in pursuit of fruits, beetles, worms, millipedes, and snails. The rainy season—when individuals are most active—also appears to be the mating season when males and females are most likely to encounter each other while foraging in the forest (Deepak *et al.* 2009; Deepak and Vasudevan, 2010 & 2013). A clutch of up to four eggs are deposited by females in the leaf litter, which hatch anywhere from 91 to 115 days after deposition (Praschag, 2022). Today, the Forest Cane Turtle is threatened by habitat loss resulting from development and wildfire, as well as subsistence hunting by local tribes.

In India, the species is also known in various dialects as *battadh* or *bettada aame* (rock turtle) in the Kannada language; *churel aamai* (cane turtle) in the Katumaran language; *vengal aamai* (brass turtle) among the Tamil tribe; and *kunde aame* (small turtle) in the Thulu language.

Although the species was first described by carcinologist John Robertson Henderson in 1912 based on two males given to him by local Kadar tribesmen the year prior, it wasn’t until 1982 that this species—by then thought to be extinct—was

rediscovered by a woman who would come to dedicate herself fully to the study of this species. Through her hard work and dedication, Jagannathan “Viji” Vijaya—the first female herpetologist in India—brought the cryptic Forest Cane Turtle out of the shadows (Vijaya, 1982) and back to the forefront of herpetology, bringing with it new hope for the turtle’s survival. This is Vijaya’s story.

1959 – VIJAYA IS BORN

On 29 October, 1959, Jagannathan “Viji” Vijaya was born in India in Bangalore in the state of Karnataka. She attended primary school in Bangalore, and then St. Joseph’s Matriculation Higher Secondary School in Coimbatore, Tamil Nadu, for two years, before moving to Chennai, Tamil Nadu, to complete her high school and her formal education. In 1975, she became a zoology student at the Ethiraj College for Women in Chennai (Lenin, 2006 and Lenin, 2017).

Very early in her life, Vijaya expressed signs of precociousness that may be attributable to the family environment in which she was raised. Vijaya’s family had a long history of military service. One grandfather was an army doctor, and various uncles were colonels, all of whom likely influenced young Vijaya’s strong values, strict routines, and physical and moral bravery. Another grandfather was a judge, and another relative the founder of the Indu newspaper. Overall, Vijaya’s family was well educated and cultured.

Although Vijaya’s father spent much of the time out of town for work, when present he was nevertheless considered to be rather progressive in the old India. Vijaya’s mother’s situation, however, was complicated. When Vijaya was still only seven or eight, her mother succumbed to schizophrenia. As her health declined, Vijaya’s father took over the household and parenting, awakening at 3:30 AM, preparing the day’s meals and his girls’ lunches, and dropping them at school (Whitaker 2023).

Such events may have hardened her and forced her to grow and gain in maturity very quickly. Being the eldest child, Vijaya was always very protective of her family, including her two younger sisters Prabha and Vidya. Together, the family enjoyed taking hikes in nature and going on adventures; this true love for each other only strengthening their family bonds. Prabha described Vijaya as “*intense, commit-*



Fig. 1. Adult male Forest Cane Turtle. Photo by Sandeep Das.

ted, exceptional and magnetic” (Lenin, 2017) but also recognized that the incredible facade of strength hid a lot of vulnerability and sensitivity.

Not only did Vijaya take care of her sisters’ formal education, she also taught them about, and shared with them her true love of nature. Owing to her curiosity, Vijaya had always felt an attraction to the forest. As a kid she notably explored the mouth of the Cooum River. Of course, her special love was animals, and she rescued all sorts of abandoned creatures. Rapidly, the household became the home of a Bonnet Macaque (*Macaca radiata*) named Massey. At first, Vijaya’s dad banished Vijaya from the main house for three days because of the macaque, although, as proof of her perseverance, she was able to keep the monkey in the end. Other creatures in her menagerie included a white mouse, a chameleon, sand boas, a little fox, and giant spiders that she bred by the hundreds. The family was regularly given lessons on how to handle wild gecko eggs they might encounter cleaning the house. Naturally, chelonians became part of the party in later years with “Melvin” the Forest Cane Turtle and “Emma” the Travancore Tortoise (*Indotestudo travancorica*).

But Vijaya was not a hoarder like it might appear. She truly loved animals, but also knew very early on that they belonged in the wild. For that reason, she used some of her pocket money to become a member of the Jersey Wildlife Trust. She was inspired by stories from Africa narrated by her

grand-uncle and wanted to do conservation work there. The heroes in her life included all the wildlife celebrities of the time, such as Jane Goodall, Dian Fossey, Jacques Cousteau, and Reinhold Messner. Also noteworthy was Vijaya’s choice to become a vegetarian, a pioneering decision in the India of the 1970s.

Looking at Vijaya’s first years of life reveals much about the future strong, intelligent woman she would become. Her childhood and student years cultured her unique personality. She had become a woman who could identify planes by looking at their tail lights in the sky as much as she could find herself at home exploring the forest, all examples of her great curiosity, and intelligence.

FROM A BOLD KID TO A BRILLIANT STUDENT

In 1975, at the age of 16, Vijaya enrolled as a first-year zoology student at the Ethiraj College for Women in Chennai. To prepare this article, I had the honor to of speaking with friends and people who worked with Vijaya. Her friend Pramila Rajan, current Director of the Madras Crocodile Bank (aka, the CrocBank), describes the happy student days:

We were both in the same class majoring in Zoology and Botany, Physics and Chemistry as additional subjects. She was a quiet person, always dressed in pants and a dark checked shirt

with a mop of curly hair that framed her face. Initially, she did not interact much with the rest of the girls (yes, it was an all-girl college) and even spent the lunch break in the library catching up on National Geographic and other books on wildlife. She loved to read and was the first to introduce me to Gerald Durrell. (Rajan, pers comm. 23rd December 2023)

For a girl to dress like a boy in the India of the 1970s was a tremendous sign of independence and singularity for the young Vijaya. She suffered many unfortunate, derogatory remarks during her school bus commute. However, thanks to her sturdy character, Vijaya did not permit such behavior and never hesitated to strike back at the rude boys. Pramila Rajan (pers com. 23 December 2023) also describes Vijaya as a dreamer, saying that:

Viji and I were both back benchers in class. Every so often, she would fall asleep especially during the Chemistry class and I would nudge her to wake her up before the teacher decided to throw a piece of chalk at her... and believe me she had good aim. I am quite sure she was dreaming of all the exciting things she could do if she were out in the forest somewhere.

As time passed, Vijaya followed a very classical path for any passionate biologist. Before long, she applied to become a volunteer at the Madras Snake Park. Romulus Whitaker, the founder of the park, remembers (pers comm. 20th December 2023) :

Viji, as she was known to us, was a first-year college student when she showed up to volunteer at the Madras Snake Park in 1975. From the start it was obvious that she had a real fondness for reptiles, particularly turtles and tortoises.

In 1976, Romulus founded the Madras Crocodile Bank Trust with the goal to study and protect the crocodiles and all the reptiles of India. Obviously, these missions appealed to the young, driven Vijaya. At the park, her tasks included cleaning reptile cages, organizing public visits, helping in the office and the library, recording lengths of baby pythons, and taking care of baby crocodiles. Vijaya looked forward to every weekend since it was the only time she could work at the park (Whitaker 2023).

Even though Vijaya was enjoying her time at Madras, what she really wanted was studying in the field. On her own, and with the help of friends (notably, herpetologist and wildlife filmmaker Shekar Dattatri and Pramila Rajan, future Director of The Madras Crocodile Bank Trust), she was already organizing fieldtrips to look for rock lizards, the Peninsular Rock Agama (*Psammodromus dorsalis*), scorpions, and snakes in Mambakkam, Ottiyambakkam, and Chitlapakkam. At this age Vijaya was not scared to go into the forest at night to climb a tree overlooking a waterhole to observe the wildlife coming to drink.

Romulus Whitaker soon noticed Vijaya's special interests and her burgeoning potential. He was quick to send her into the field as part of a study to collect crocodile scat at the

Amavarati and Sathanur reservoirs in Tamil Nadu. Another time, she was assigned the task of investigating the turtle market in West Bengal. Very early on, Vijaya had all the qualities of a great scientist "*en devenir*" (in the making): she was observant, meticulous, brave, and focused. "*Rom could not have found a more committed volunteer, nor she a better mentor,*" Zai Whitaker aptly noted (Whitaker 2023). Vijaya appreciated sharing her knowledge, organizing lectures, and bringing snakes into schools as part of talks and lessons. She took notes about everything, knew how to draw, and was already contributing to science by publishing in *Hamadryad*, the then-young publication of the Madras Crocodile Bank.

Vijaya completed college in 1980 and became a full-time research assistant at the Madras Crocodile Bank by September 1981. This position allowed her to start focusing on research and she quickly demonstrated her talent. She published her first note in *Hamadryad* in 1980 on ophiophagy in the rat snake. All the while, Vijaya's interest in turtles was growing and her career was looking more and more promising as she was becoming the first ever female herpetologist in India (Whitaker 2023).

THE FIRST FEMALE HERPETOLOGIST IN INDIA

Vijaya's career started in a moment when worldwide awareness about wildlife conservation was in full swing; the non-governmental organizations WWF-India (World Wide Fund for Nature), for example, was founded in 1969. The paradigm change from research and natural history to conservation had already happened and the vision of the people working with animals was evolving. This shift was also underway in India, and the Madras Crocodile Bank played a key role. Romulus was assigning work to each of his staff and Vijaya, who was only 22, was tasked to assist Eastern Illinois University professor Edward O. Moll, first Chair for the International Union for Conservation of Nature (IUCN) Freshwater Turtle Specialist Group from 1981 to 1985, in a nation-wide survey to assess the status of Indian turtles. Moll planned to spend 9 months in India researching the ecology, distribution, and conservation status of Indian turtles, about which little was known at that time. What was known was that turtles were already being heavily exploited for any number of reasons, but especially for the food market. In 1982, Vijaya noted, "While sea turtles have received a fair amount of attention in recent years in India, freshwater turtles have largely been ignored except when in a curry." (Vijaya and Manna, 1982).

In 1981, at the end of the summer, Vijaya's journey began in West Bengal, the region where turtle meat was the most consumed. She met with colleagues Pankaj Manna of the University of Calcutta to begin the market survey, which involved trapping with nets, interviews, and market investigations. Turtles, especially soft-shelled turtles, were a primary source of protein for many people and were sold cheaper than beef, ranging anywhere from Rupees 5 to Rs. 18 per kilo. Species like the Ganges Softshell Turtle (*Nilssonina ganget-*

ica) and the Indian Narrow-headed Softshell Turtle (*Chitra indica*) were frequently sold during the winter because they were easier to catch when the rivers ran low (Fig. 2). Even Northern River Terrapin (*Batagur baska*) were occasionally caught during the winter. Turtle eggs, especially those of the big softshell turtles, were also part of the commercial harvest (Whitaker 2023).

One of the biggest challenges of addressing the turtle trade is to understand the main routes and origins of the turtles offered for sale in the market. Vijaya documented the movements of the turtles, sometime coming from Gorakhpur, Uttar Pradesh, and going to Assam or Bengal. This market represented a lot of money and Vijaya was the first person to ever document how it worked. As many as 20 people worked to catch turtles in different water bodies, rivers, and reservoirs. Then the turtles were shipped by train and stored in atrocious conditions until they reached the food market. In the Howrah Railway Station of Calcutta during the winter, 10 baskets stocked with 10 to 20 turtles arrived from Uttar Pradesh every day. (Vijaya and Manna 1982).

Vijaya also described in detail the hunting techniques. The large Indian Softshell Turtles were caught with a hook from a boat or underwater. The Indian Flapshell Turtle (*Lissemys punctata*) were caught by hand during the dry season while they were buried in mud. With the data gathered by Vijaya, Moll estimated that 50,000 to 70,000 Indian Flapshell Turtles, 7,000 to 8,000 large soft-shelled turtles, and at least 10,000 to 15,000 hard-shell turtles were traded in the Howrah market of Calcutta (Moll and Moll, 2004). During the surveys, Vijaya had to travel to the ‘wild west’ of India and difficult parts of Uttar Pradesh. Such hardships never prevented her from studying these turtles to better protect them. Indeed, conservationists like Vijaya and the “turtle men”, as she called them, were witnessing the extinction of the resource being unsustainably harvested. In most of her reports, she tried to provide solutions to stop turtle exploitation. For example, Vijaya explored the feasibility of farming the turtles to provide food sustainably (Vijaya, 1983). Romulus Whitaker remembers:

When US turtle expert Ed Moll came to India Viji became his field assistant and her energy and persistence took her to remote corners of India... Viji then went to Digha in West Bengal and with the Snake Park's decrepit Olympia camera she took dozens of pictures of the hundreds of olive Ridley's sea turtles being harvested and slaughtered for their meat. When these photos were published in India's major magazine, India Today, they attracted the attention of Prime Minister Indira Gandhi and she very quickly made sure that the trade in sea turtles ceased.



Fig. 2 J. Vijaya and Boopathi with Ganges Softshell Turtle (*Nilssonina gangetica*) at Madras Crocodile Bank in 1978. Photo by Romulus Whitaker.

Vijaya's sea turtle research, too, was far from a walk on the beach. During her countless hours in the field, she counted eggs and shells, but also regularly witnessed the slaughter of turtles firsthand (Fig. 3). As a witness, she took on the responsibility of documenting the commercial harvest through photography, another innovation in India at that time. That such



Fig. 3. Harvest of the Olive Ridley's Turtles (*Lepidochelys olivacea*) at Digha beach in West Bengal. This picture is from a series that contributed to wake India up to the tragedy of the slaughter and fostered Prime Minister Indira Gandhi to protect sea turtles. Photo by Jagannathan Vijaya.



Fig. 4. One of the first picture ever taken of a Forest Cane Turtle. Photo by Romulus Whitaker.

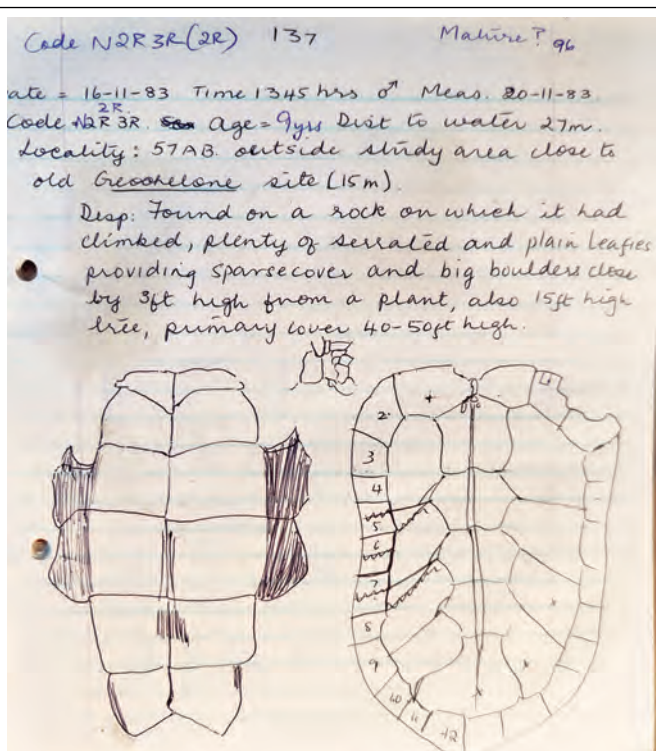


Fig. 5. Right: Field notes and drawing of Vijaya. Scan from Nikhil Whitaker used in his publication (Whitaker, and Vijaya, 2009).

research was taking place in India was novel enough; that Vijaya was a pioneer in the field of herpetology dominated primarily by male researchers was extraordinary.

THE REDISCOVERY

In the 67 years since the Forest Cane Turtle was first described in 1912 by Dr. Henderson (Henderson, 1912), it had gone unnoticed. If someone had to study this species, there was no better candidate than Vijaya. In the 1980's, due to recent taxonomic revision, the turtle was recognized as *Heosemys silvatica* (Ernst and Barbour 1989) and many herpetologists believed it had gone extinct (Vijaya, 1982). In 1981, Vijaya departed for Kerala, one of the states where the turtle had been found. She followed the route described by Henderson in his description, which was not very clear, and sought the help of the local Kadar of Chalakudi tribe.

The local Kadar tribe are an indigenous community of south India whose "proto-Dravidian" ethnolinguistic history suggests deep roots in the region. Today, they are an officially-designated Scheduled Tribe in the states of Tamil Nadu, Karnataka, and Kerala. The tribe is overseen by a headman, or *Moopan*, which means the eldest one. Formerly a nomadic people, they have since adapted to a

more semi-nomadic, settled lifestyle today, but remain very comfortable living from the forest by hunting and gathering. They specialize in collecting honey, sago, arrowroot, bark, resin, and wood, but are also notorious for their consumption of turtles. Although many of the Kadar tribe members have moved closer to the plains and urban centers in recent years, their presence in the forest is still evident by the presence of tall ladders in trees necessary to collect honey.

After making their acquaintance, the Kadar's *Moopan* helped Vijaya explore the forest until, in July 1982, Vijaya spotted, at long last, her first Forest Cane Turtle—a male—near Chalakudy (Fig 4). Vijaya's notes and reports about her encounter include a careful description of the Forest Cane Turtle's morphometry, diet, and behavior, speculating that the species might be nocturnal and appeared very shy (Fig. 5). This first male was collected and brought back to the Madras Crocodile Bank, where it was joined soon after by other individuals. With the rediscovery of this species, Vijaya began to study every aspect of its natural history extensively. As usual, she took on this task with heart and an extreme level of professionalism. Because the turtles were found living in very remote areas, Vijaya spent several months living in the forest, camping in a cave with the permission of the forest department (Whitaker 2023).

In June 1984, Zai Whitaker had the privilege to visit Vijaya in the forest while she was camping in the cave to study the turtles. Vijaya was staying there with Chandran, a Kadar tribesman, and members of his family (Fig. 6). Chandran and his family were essential in supporting Vijaya during her re-

mote field work. The Kadar were known to use dogs to find tortoises for their meat, especially the Travancore Tortoise. Whitaker’s journey was long to reach the study site in the steep mountains. The camp, based around 50 meters above a stream, shared the forest with neighbors such as elephants, bears, and leopards. In camp, the group ate snails, elephantine purple tuber, and exotic products harvested directly from the forest by Chandran’s wife, Laila. Although the forest’s megafauna could be dangerous, of equal concern were smaller animals that were just as dangerous, like the Hump-Nosed Pit Viper (*Hypnale hypnale*).

Whitaker recalls that one time, “just before leaving the camp on the first day, we were putting on our damp, steaming shoes when a scorpion careened up Vijaya’s leg. It was gently apprehended with a twig and deposited on the camp’s periphery”. Vijaya respected all living critters and was also very careful while walking through the forest, avoiding stepping on insects and other animals (Whitaker 2023).

According to Whitaker, the study site had been divided into forty 200 meters grids that Vijaya and her local assistant surveyed every morning and—once Vijaya had determined that the Forest Cane Turtle was nocturnal—every evening. Their hard work paid off through the documentation of key milestone observations, such as a Forest Cane Turtle eating mushrooms at night. But their biggest discovery was that this turtle—previously thought to be herbivorous—was in fact also consuming invertebrates. With these observations, Vijaya expanded their known diet to include worms, millipedes, and beetles, with mollusks and snails in particular their probable favorite food item.

Vijaya had prepared for this type of fieldwork since her childhood and felt very comfortable in the wild. “Viji was totally at home in the forest,” says Whitaker. “There were leeches everywhere, in large numbers, but she took them in her stride. The drooling rivulets of blood on her legs did not bother her at all.” (Whitaker 2023). Another of Vijaya’s striking qualities was her ability to find her way in the forest without any assistance. She learnt from the Kaders but also the Irulars, the two tribes she considered family. Although they came from different backgrounds, Vijaya always considered the locals as partners and teachers. She was never condescending to them. She knew they represented an incredible source of knowledge about nature and were exemplary guides.

Vijaya’s incredible determination and willingness to investigate and record all the life traits of the Forest Cane Turtle led her to publish several innovative studies. Under the advice of Moll, she initiated a study looking at the movements of the turtles to better understand their daily activity patterns (Groombridge *et al.* 1983; Moll *et al.* 1986). Without ready access to radio telemetry equipment, Vijaya used a spool of thread gently attached to the turtles with Araldite epoxy so that she could document their movements. Each turtle was individually marked by notching their scales with a hacksaw blade. During her fieldwork, she marked 125 Forest Cane



Fig. 6. Kadar tribal children with Forest Cane Turtles at Vijaya’s study site in Kerala. Photo by Zai Whitaker.

Turtles and Travancore Tortoises. In addition to the natural history data she collected, Vijaya extended the range of the Forest Cane turtles to include new, previously undocumented places, especially the Neyyar Wildlife Sanctuary in Kerala and Agumbe in Karnataka. By keeping individuals in captivity (Figs. 7 & 8), Vijaya was also able to document the reproductive biology of the turtles. One wild caught female indeed laid two eggs at the Madras Crocodile Bank on December 22, 1982 (Vijaya, 1983).

In October 1982, Vijaya took Edward Moll and Brian Groombridge in the field to lead a more intensive search for turtles with the help of the Kaders. The five-person team was lucky enough to find 10 animals, including a juvenile, a survey effort equivalent to 0.26 turtle per man hour. According to Groombridge *et al.* (1983), they learned that while the turtle was very difficult to find, it was probably less uncommon than previously thought. This time, Vijaya was able to find a female, which allowed Vijaya to describe the sexually dimorphic characteristics of the species. The team also collected novel material from its scat, which indicated the turtle had been consuming millipedes and confirmed the species was omnivorous.

The story of the Forest Cane Turtle’s rediscovery spread rapidly throughout the herpetological community and around the globe, making Vijaya famous for her hard work. She published in several international journals such as the *Journal of the Bombay Natural History Society*, the *Tortuga Gazette*, *Oryx*, and *Hornbill*. A trove of new information about this cryptic species was finally available.

From Vijaya’s fieldnotes and reports, the Forest Cane Turtle always appeared to be very hard to find. The turtle’s abil-



Fig. 7. Vijaya with the Forest Cane Turtle. Photo by Zai Whitaker.



Fig. 8. Vijaya with a Forest Cane Turtle at a camp in Kerala in 1983. Photo by Zai Whitaker.

ity to hide, its very shy and secretive behavior, and the difficulty associated with accessing its remote habitat without the assistance of the local tribes likely explains its disappearance for so many years. Likewise, Vijaya's determination, dedication, and passion explain why she was the perfect naturalist to rediscover it.

A TRAGIC ENDING

Through her work with the Forest Cane Turtle, Vijaya had become a renown turtle specialist. She was following in the footsteps of the best conservationists and scientists of the time, and had the benefit of Whitaker and Moll for mentors. Her work on the Forest Cane Turtle, and on the trade and exploitation of softshell turtles and sea turtles was ongoing and moving in the right direction. The natural next step was for

her to go back to university for a master's degree in ecology. After that, she could take a more prominent role as a lead researcher and conservationist in India, all while leading a team in the ongoing study of the Forest Cane Turtle. There was still a lot to do to help ensure the survival of India's chelonians. In 1985, when Moll offered Vijaya a position in the University of Illinois' Masters in Zoology program, she flew to the United States to start this next chapter of her life.

Upon her arrival, she began to show signs of a mental disorder. Varying stories from friends and sisters mention Vijaya may have inherited this psychiatric illness from her mother. It seemed that Vijaya had not been well prepared for such a big move and was struggling to adapt to the cold weather. Vijaya was an extremely hard worker, but her new scholarship challenges came with no small amount of stresses. Her family received heart-wrenching letters in which Vijaya said she missed the forest, and heard voices from the wall of her dormitory room. In letters, Vijaya wrote "They say it is lonely at the top and hard in the middle. I don't know about that, but I know it's rotten at the bottom". Writing about Moll and his wife, she said "I did not give them anything except a lot of worry". Reading such letters, and knowing Vijaya as well as she did, Prabha advised her sister to catch the first flight home. In 1986, less than a year after her departure, Vijaya returned home to her family.

Unfortunately, her return to her previous life in Chennai did not bring her clarity of mind. Many changes had taken place at the Madras Crocodile Bank, and new staff in new positions made Vijaya feel unwanted. As Prabha writes, "Viji was a fiery, attractive young woman in her twenties when she had to sort out her inner devils. She sought to throw herself deeper into her work as many of us do. But on the work-front she suffered a crisis of confidence when she felt that others were staking claim to her life's work."

Vijaya asked her supportive father for money to finance her turtle research, and he accepted hoping it would appease her. Despite her fragile psychological state, Vijaya could not accept failure. Still, these changes were adding up, and Vijaya had lost her self-confidence. The stress of it all proved too much for her, so her family started to look for therapy. At that time, electroconvulsive therapy was the common therapy prescribed for certain mental illness. Instead, her loving father searched for a more progressive treatment until he found a therapist, Dr. Rudran, with whom Vijaya was comfortable.

Although Prabha and Vidya were very supportive, they felt helpless against the disease. After her American adventure, Vijaya seemed extremely stressed and disturbed and was no longer the same person they remembered anymore. Her sisters couldn't recognize her. Vijaya's time in treatment proved very difficult for the entire family during her slow recovery toward any semblance of normalcy.

One day in 1987, she disappeared without leaving any hint or track. Three months after her unexplained departure, Vijaya's bones were found in Guindy National Park in Chennai. To this day, what transpired during her last months remain a

mystery. On April 18, 1987, at the age of 28, Vijaya was officially declared dead. Given what we know about Vijaya's life, it stands to reason Vijaya may have sought refuge from her troubled mind in the forest, the place she loved the most.

In Whitaker's apt words, “Viji died at a very young age and India lost one of the most ardent field biologists we have ever known.” (Pers comm. 20th December 2023).

A TURTLE NAMED AFTER VIJAYA

Unfortunately, Vijaya's death relegated the Forest Cane Turtle back into a forgotten corner of herpetology for another 20 years. After Vijaya's passing, it wasn't until 2006 that the turtle received any considerable attention thanks to a team of Austrian and German researchers led by Peter Praschag. This time around, the researchers sought to reevaluate the systematic position of the turtle first described in 1912 by Henderson as *Geoemyda silvatica*.

The genus *Geoemyda* Gray, 1834 had a long history of taxonomic and nomenclatural confusion and was used regularly by herpetologists to name species with unclear status. In 1964, McDowell transferred *Geoemyda silvatica* to *Heosemys* Stejneger, 1902. After the rediscovery in 1982, Moll *et al.* (1986) studied the morphology and osteology of the turtle and compared it with *Geoemyda spengleri*, *Heosemys grandis*, and *Heosemys spinosa*. They concluded it should be placed back under the genus *Geoemyda*. While this proposition was not accepted by everyone (e.g., Ernst and Barbour, 1989), although many authors accepted it (Das, 1995). McCord *et al.* (1995) considered *Geoemyda silvatica* a sister taxon of the newly described *Geoemyda yuwonoi*. On the other hand, Yasukawa *et al.* (2001) saw *Geoemyda silvatica* as a sister species of *Geoemyda japonica* and *G. spengleri*.

When Praschag *et al.* (2006) studied the mitochondrial cytochrome-b gene from three individuals of *Geoemyda silvatica*, the team also provided new and detailed insights on the osteology of the taxa, comparing it to other close relatives. The results of the study conclude that *Geoemyda silvatica* is outside all the previously mentioned clades and could be regarded as a monotypic genus, which warranted a novel name. To pay tribute to the incredible work of Vijaya, the team decided to name the genus in her honor with the scientific name *Vijayachelys silvatica* (Praschag *et al.* 2006).

The phylogenetic tree that resulted from the study also helped confirm Henderson's then-unsubstantiated hypothesis regarding the relationship between *Vijayachelys* and *Melanochelys*. Although those two genera could be distantly related, the authors opted to keep *Vijayachelys* dissociated from the groups it usually was placed alongside in tree-building methods, *Heosemys* or *Geoemyda*. The paper also highlights the importance of genetics and morphology informing taxonomic decisions. Indeed, *Vijayachelys* clearly share some common morphology, like hooked beak, three keeled shell, leaflike shell or short gular scutes, with other species in similar habitats: *Leucocephalon yuwonoi*, *Geoemyda spengleri*, and *G.*

japonica. Still, *Vijayachelys silvatica* is closer to *Melanochelys trijuga* than any species of *Geoemyda*. It is a good example of convergent evolution influenced by similar life histories.

Although this taxonomic change was clearly warranted, it also allowed for a beautiful tribute to Vijaya in remembrance for her contributions to the field of herpetology and our understanding of the Forest Cane Turtle's natural history. The Madras Crocodile Bank erected a memorial close to a turtle pond in the honor of Vijaya, whose name will long be remembered in the herpetological community through the turtle to which she dedicated years of study.

ACKNOWLEDGMENTS

Kraig Adler, Breck Bartholomew, Matthew Bettelheim, Sandeep Das, Thierry Frétey, Eric Goode, Anita Mani, Jérôme Maran, Pramila Rajan, Zai, Romulus, and Nikhil Whitaker.

BIBLIOGRAPHY OF J. VIJAYA

This chronological bibliography of Vijaya was largely put together by Janaki Lenin (2006) *Indian Ocean Turtle Newsletter* (4):35–36, and illustrates the unstoppable hard-working mindset of the young researcher she was. All articles published in *Hamadryad* are available at: <https://hamadryad.org/index.php/journal/issue/view/3>.

- Vijaya, J. 1980. Observations: rat snake (ophiophagus). *Hamadryad* 5(3):3.
- Larson, B. and J. Vijaya. 1981a. [*Python molurus* hatchlings]. *Hamadryad* 6(1):12.
- Larson, B. and J. Vijaya. 1981b. [*Iguana iguana* hatchlings]. *Hamadryad* 6(1):13.
- Vijaya, J. 1981a. The crocodile rearing project at Sathanar. *Hamadryad* 6(2):3–4.
- Vijaya, J. 1981b. Breeding Notes – *Lissemys* hatching at MSP, Chameleon hatching at MSP, Common monitor hatching at MSP. *Hamadryad*, 6 (3):10.
- Vijaya, J. 1982a. Flap-shell turtle nests at Taramani, Madras. *Hamadryad*, 7 (1):5.
- Vijaya, J. 1982b. Freshwater turtles. *Hamadryad*, 7 (1):11–13.
- Vijaya, J. 1982c. Indian cobra (*Naja naja naja*) growth rates in one year. *Hamadryad*, 7 (2):7.
- Vijaya, J. 1982d. The flapshell turtles. *Hornbill*, 1982 (3):12–14.
- Vijaya, J. 1982e. Rediscovery of the forest cane turtle (*Heosemys silvatica*) in Kerala. *Hamadryad*, 7(3):2–3.
- Vijaya, J. 1982f. *Kachuga tecta* hatching at the Snake Park. *Hamadryad* 7(3):14–15. [actually *K. tentoria*]
- Vijaya, J. 1982g. Breeding data on *Melanochelys trijuga trijuga* and *Melanochelys trijuga coronata*. *Hamadryad* 7(3):16.
- Vijaya, J. 1982h. *Pelochelys bibroni* from the Gahirmatha coast, Orissa. *Hamadryad* 7(3):17.
- Vijaya, J. 1982i. Size of the Travancore tortoise *Geochelone travancorica*. *Hamadryad* 7(3):22.
- Vijaya, J. 1982j. Successful artificial breeding of *Lissemys punctata granosa* (Smith). *Journal of the Bombay natural History Society*, 79:210–211.

- Vijaya, J. 1982k. Rediscovery of the forest cane turtle, *Heosemys (Geomyda) silvatica* (Reptilia, Testudines, Emydidae) from Chalakudy forests in Kerala. *Journal of the Bombay Natural History Society* 79(3):676–677.
- Vijaya, J. 1982l. Rediscovery of a poorly known turtle from Kerala forests (South India) after fifty years. *The Tortuga Gazette* 18(11):7–8.
- Vijaya, J. 1982m. Rediscovery of a rare turtle from Kerala forests. *Hornbill*, Oct. /Dec. 1982:25–26.
- Vijaya, J. 1982n. Focus on conservation of freshwater chelonians in India. *Tiger Paper* 9(3).
- Vijaya, J. 1982o. Turtle Slaughter in India. *Marine Turtle Newsletter*, 23:2.
- Vijaya, J. & P. Manna. 1982. A preliminary status survey of freshwater turtles in West Bengal, India. Report to the World Wildlife Fund-US.
- Moll, E.O., B. Groombridge & J. Vijaya. 1983. Update on the Olive Ridley on the East Coast of India. *Marine Turtle Newsletter* 25:2–4.
- Vijaya, J. 1983a. Exploring the feasibility of freshwater turtle breeding for commercial purposes. *Hamadryad* 8(1):6.
- Vijaya, J. 1983b. First report of *Amblyomma geoemydae* from India. *Hamadryad* 8(1):13.
- Vijaya, J. 1983c. World's rarest turtle (we think) lays eggs in captivity. *Hamadryad* 8(1):13.
- Vijaya, J. 1983d. *Pelamis platurus* from Madras. *Hamadryad* 8(1):19.
- Vijaya, J. 1983e. Second search for cane turtles *Heosemys silvatica* in Kerala. *Hamadryad* 8(1):20.
- Vijaya, J. 1983f. Freshwater turtle survey in India 1982–83. *Hamadryad* 8(1):21–22.
- Vijaya, J. 1983g. Auditory cues as possible stimuli for hatching eggs of the flap-shell turtle *Lissemys punctata granosa*. *Hamadryad* 8(1):23.
- Vijaya, J. 1983h. Gharial project in Uttar Pradesh. *Hamadryad* 8(1):24.
- Vijaya, J. 1983i. Range extension for the Spotted Pond Turtle *Geoclemys hamiltoni*. *Hamadryad* 8(2):20.
- Vijaya, J. 1983j. The Travancore tortoise, *Geochelone travancorica*. *Hamadryad* 8(3):11–13.
- Vijaya, J., S. Dattatri & D. Samarajiva. 1983. Turtle survey in southern Sri Lanka. *Hamadryad* 8(3):15–17.
- Vijaya, J. 1984a. Cane turtle (*Heosemys silvatica*) study project in Kerala. *Hamadryad* 9(1):4.
- Vijaya, J. 1984b. A *Calotes grandisquamis* nest. *Hamadryad* 9(2):19.
- Groombridge, B., E. O. Moll & J. Vijaya. 1984. Rediscovery of a rare Indian turtle. *Oryx* 17(3):66.
- Moll, E.O., B. Groombridge & J. Vijaya. 1986. Redescription of the cane turtle with notes on its natural history and classification. *Journal of the Bombay Natural History Society* 83 (supplement December 1986):112–126.
- Moll, E. & J. Vijaya. 1986. Distributional records for some Indian turtles. *Journal of the Bombay Natural History Society* 83:57–63.
- Vijaya, J. 1988. Status of the forest cane turtle (*Geomyda silvatica*). *Hamadryad* 13(2):10.
- Vijaya, J. 1989. Kadars – People of the forest. *Hamadryad* 14(1):10.
- Whitaker, N. & Vijaya, J. 2009. Biology of the forest cane turtle, *Vijayachelys silvatica*, in South India. *Chelonian Conservation and Biology* 8(2):109–115.
- ## REFERENCES
- Das, I. 1995. *Turtles and Tortoises of India*. Worldwide Fund for Nature—India, Oxford University Press, Bombay, 176 pp.
- Deepak, V. and K. Vasudevan. 2010. Note on defensive behaviour of Cochin Forest Cane Turtle (*Vijayachelys silvatica*). *Reptile Rap – Newsletter of the South Asian Reptile Network* 9:1–2.
- Deepak, V. and K. Vasudevan. 2013. Aggressive interactions among male cane turtles *Vijayachelys silvatica* (Henderson, 1912). *Herpetozoa* 25(3/4):159–163.
- Deepak, V., K. Vasudevan, and B. Pandav. 2009. Preliminary observation on the diet of cane turtle (*Vijayachelys silvatica*). *Hamadryad* 34(1):166–168.
- Deepak, V., P. Praschag, and K. Vasudevan. 2014. *Vijayachelys silvatica* (Henderson 1912) – Cochin Forest Cane Turtle. In: Rhodin, A.G.J., P.C.H. Pritchard, P.P. van Dijk, R.A. Saumure, K.A. Buhlmann, J.B. Iverson, and R.A. Mittermeier (Eds.). *Conservation Biology of Freshwater Turtles and Tortoises: A Compilation Project of the IUCN/SSC Tortoise and Freshwater Turtle Specialist Group. Chelonian Research Monographs* (5):078.1–7.
- Ernst, C.H. and R.W. Barbour. 1989. *Turtles of the World*. Smithsonian Institution Press, Washington DC, xii, 313 pp.
- Groombridge, B., E.O. Moll, and J. Vijaya. 1983. Rediscovery of a rare Indian turtle. *Oryx* 17:130–134.
- Henderson, J.R. 1912. Preliminary note on a new tortoise from south India. *Records of the Indian Museum* 7:217–218.
- Kanagavel, A. and R. Raghavan. 2012. Local ecological knowledge of the threatened Cochin Forest Cane Turtle *Vijayachelys silvatica* and Travancore Tortoise *Indotestudo travancorica* from the Anamalai Hills of the Western Ghats, India. *Journal of Threatened Taxa* 4(13):3173–3182.
- Lenin, J., 2006. Viji, the Turtle Girl. *Sanctuary Asia* 26(6):62–65, 91.
- Lenin, J. 2017. Tribute: Viji, the turtle girl. *Ecologise*. 18 April.
- McCord, W.B., J.B. Iverson, Boeadi, 1995. A new Batagurid turtle from northern Sulawesi, Indonesia. *Chelonian Conservation and Biology* 1(4):311–316.
- McDowell, S.B. 1964. Partition of the genus *Clemmys* and related problems in the taxonomy of aquatic Testudinidae. *Proceedings of the zoological Society of London* 143:239–279.
- Moll, E.O., B. Groombridge, and J. Vijaya, 1986. Redescription of the cane turtle with notes on its natural history and classification. *Journal of the Bombay Natural History Society* 83(supplement):112–126.
- Moll, D. and E.O. Moll. 2004. *The Ecology, Exploitation and Conservation of River Turtles*. Oxford University Press, New York, x, 303 pp.
- Praschag, P., C. Schmidt, G. Fritzsche, A. Muller, R. Gemel, and U. Fritz. 2006. *Geoemyda silvatica*, an enigmatic turtle of the Geoemydidae (Reptilia: Testudines), represents a distinct genus. *Organism Diversity & Evolution* 6:151–162.
- Praschag, R. 2022. Die Gelbkopf-Erdschildkröte, *Vijayachelys silvatica* – eine mystische Schildkröte der Western Ghats. *Elaphe* 2022(6):42–53.
- Vasudevan, K., B. Pandav, and V. Deepak. 2010. Ecology of two endemic turtles in the Western Ghats. Final Technical Report 2010. Wildlife Institute of India, 74 pp.
- Vijaya, J. 1982. Rediscovery of the forest cane turtle (*Heosemys silvatica*) of Kerala. *Hamadryad* 7(3):2–3.

- Vijaya, J. and P. Manna. 1982. A preliminary status survey of freshwater turtles in West Bengal, India. Report to the World Wildlife Fund-US.
- Vijaya, J. 1983. World's rarest turtle (we think) lays eggs in captivity. *Hamadryad* 8(1):13.
- Whitaker, N. & Vijaya, J. 2009. Biology of the forest cane turtle, *Vijayachelys silvatica*, in South India. *Chelonian Conservation and Biology* 8(2):109–115.
- Whitaker, Z. 2023. Turtle Girl. Pp. 55–76 in: A. Main (ed.) *Women in the Wild: Stories of India's Most Brilliant Women Wildlife Biologists*. Juggernaut, New Delhi.
- Yasukawa, Y., Hirayama, R., Hikada, T., 2001. Phylogenetic relationships of Geoemydine turtles. *Current Herpetology* 20, 105–133.
- We suggest the following format for citing this article:
Rouot, S. 2024. Jagannathan “Viji” Vijaya and the Forest Cane Turtle (*Vijayachelys silvatica*, Henderson 1912). *Bibliotheca Herpetologica* 18(9):88–97.

The Boy Scouts of America *Reptile Study* Merit Badge Pamphlet in World War II and the Broader Role of the Boy Scouts in Paper Rationing and Propaganda Distribution During the War

Christopher J. Bell¹ and Stacie Skwarcan²

Department of Earth and Planetary Sciences, The University of Texas at Austin, Austin, Texas 78712

¹cjbell@jsg.utexas.edu, ²sskwarca@utexas.edu

BOY SCOUT MERIT BADGE PAMPHLETS IN WORLD WAR II

John Moriarty's excellent review of the history of the Boy Scouts of America (BSA) *Reptile Study* merit badge pamphlet (Moriarty, 2012) inspired our effort to compile as complete a set as possible of the different editions and printings of that pamphlet. The successful completion of that effort yielded an unexpected surprise for us — there were three cover styles during World War II for the merit badge pamphlets published by the BSA. The earliest was printed between 1939 and 1943 (with a few copies printed early in 1944; Price, 2002:7). That cover is Joe Price's 'Type 4 — Boy Scout Standing' and was a colorful illustration of a boy scout in uniform on the left side of the front cover, backed mostly by white (Fig. 1, left)¹.

The title, an image of the merit badge, and 'Boy Scouts of America Two Park Avenue New York N.Y.' appeared on the right side, backed by red. The back cover was a colorful representation of badges of rank and achievement in the BSA (Fig. 1, right). The inside of the front and back covers provided color illustrations of the 106 merit badges available at that time (Fig. 2). The second wartime cover was printed on a thicker cardstock with a much-simplified design (Fig. 3) and was produced to

comply with wartime restrictions on use of paper and color dyes. Apart from the red background on the front cover and a descending red eagle carrying a book in its talons and a ribbon in its beak on the back cover (Fig. 4), there was no color. The ribbon reads 'Books are weapons in the war of ideas.' That cover was printed between March and November of 1944 and is Joe Price's 'Type 5A — Cardboard or war cover' (Price, 2002:7).

Beneath the eagle on the back of the war cover is a text block in small font that reads

A WARTIME BOOK

THIS COMPLETE EDITION IS PRODUCED
IN FULL COMPLIANCE WITH THE GOVERN-
MENT'S REGULATIONS FOR CONSERVING
PAPER AND OTHER ESSENTIAL MATERIALS.



THIS IS AN EMERGENCY COVER USED TO
AVOID DELAY IN PRODUCING MERIT BADGE
PAMPHLETS UNDER PRESENT CONDITIONS.

A short numeric code at the bottom of the title page ('4500644'; Conant, 1944) indicates that 4,500 copies of the Type 5A cover were printed in June 1944. An additional

¹ The cover types and wartime restrictions mentioned here are those established and documented by Joe Price in his *Kahuna's Katalog* series. The Type numbers we accept here differ from those used by Moriarty (2012) and are offset by one number — Moriarty's Type 3 is our Type 4, his Type 4 is our Type 5, etc. Moriarty's Type numbers were taken from a now-defunct web site on Boy Scout Merit Badges (Moriarty, personal communication, 10 May 2024); his data on publication numbers were drawn from a 1998 edition of a *Kahuna's Katalog* and those data are identical to those in our later edition of the Katalog. *Kahuna's Katalogs* are indispensable sources of historical data on publications of the Boy Scouts of America. Given their importance and the amount of detail they record it is somewhat surprising how few copies are held by institutional libraries participating in WorldCat. There are at least three volumes in the series (plus a separate volume on BSA editions of books in the *Every Boy's Library* series that is not considered herein), and there are several editions and printings, all under different dates (or undated). A search for 'Kahuna's Katalog' in WorldCat yielded only two records (plus one for the *Every Boy's Library* series). The first record is for *Kahunas Katalog of Boy Scouting Handbooks* with a date of 1989 (this presumably has comparable content to our Volume 1, *Kahuna's Katalog of Boy Scout & Cub Scout Handbooks* [undated, but inferred to be 1998]). No date of publication was provided in our copy of Volume 1; we use 1998 as a publication date based on the May 1998 date of the foreword by Joe Price on p. 1. The Editor's note at the bottom of p. 1 clearly indicates the existence of at least one earlier edition. The second WorldCat record is for *Kahunas Katalog of Merit Badge Pamphlets* with a date of 1993; that title was cited by Moriarty (2012) with a date of 1998, confirming at least two editions and dates. Those presumably have comparable content to our Volume 2, *Kahuna's Katalog of Boy Scout Merit Badge Books* (dated 2002). For the latter two records only one holding library is listed for each in WorldCat. There is no WorldCat record for the third volume, *Kahuna's Katalog of Boy Scout Literature* (Price, no date; not utilized herein). The volumes are currently offered for sale on Amazon and through several other online book dealers. For anyone interested in publications of the BSA they are well worth owning.



Fig. 1. Design of the Merit Badge Pamphlet cover in the early years of the war. This is an example of Joe Price's (2002) 'Type 4 – Boy Scout Standing' design. These were printed between 1939 and early 1944. The colorful inks used in the printing were eliminated in the 1944 'Type 5A' pamphlet (Figure 3). Left: Front cover. Right: Back cover.

1,000 copies were printed in September of the same year. All carry a copyright date of 1944.²

By the end of 1944 booklets with those covers had been entirely distributed for many merit badge titles and were replaced by the third type used during the war, the Type 5B cover which was made of slick clay paper but still lacked the extensive color illustrations of the printings in the early war years. Apart from the paper there is a slight difference on the cover in font size of the title and the words 'Boy Scouts of America.' The 1944 copyright date continued to be printed for many years; we have copies of *Reptile Study* with that copyright date under Price's (2002) cover Type 5B from July 1951, cover Type 6 ('red bottom, picture top'; Price, 2002:8) from September 1954 through March 1966, and Type 7A ('full picture with seal') from February 1968 through March 1971.

In addition to merit badge pamphlets many other BSA publications were impacted by wartime restrictions. As an example, the fourth edition of the *Boy Scout Handbook*

² The war years saw a change in authorship from William G. Hassler to Roger Conant (Moriarty, 2012); the 1944 copyrighted version was the first authored by Roger Conant.

(1940–1946; perhaps more properly a newly copyrighted continuation of the third edition — see Price [1998:4, 118]) also was impacted by wartime rationing — at the fifth printing (September, 1944), the size was reduced from 4.5 x 7 inches to 4 1/4 x 6 5/8 inches (Price, 1998:128-129), and all color printing was eliminated to reduce use of pigments essential for the war effort. Many other publications of the Boy Scouts of America that were printed in 1944 and 1945 carry notices of compliance with wartime restrictions; the notice was dropped by March 1946 (Price, 1998:340).

The broader context of those rationed materials lies in the general wartime restrictions under which many people lived during the war. That context also intersects again with the BSA in several ways and is discussed below.

RATIONING AND PRICE CONTROL ON THE UNITED STATES HOME FRONT

As World War II begins to fade from living memory it becomes more difficult for many people to realize and understand the profound impacts of the war on domestic life and

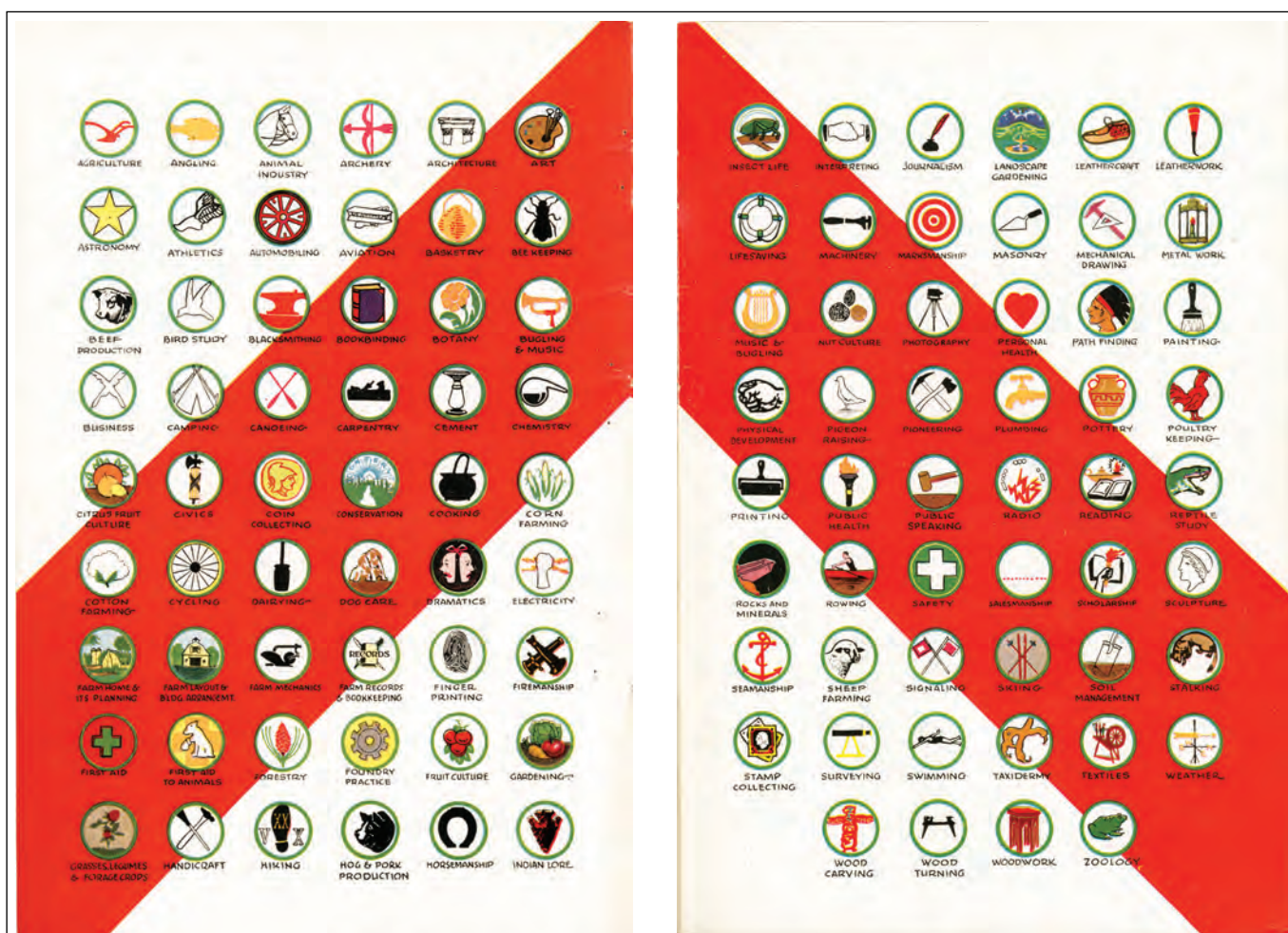


Fig. 2. Design of the inside covers of the Merit Badge Pamphlet in the early years of the war. The colorful inks used in the printing were eliminated in the 1944 'Type 5A' pamphlet. Left: Inside front cover. Right: Inside back cover.

activities on the 'home front' in various countries. In Europe and much of Asia the challenges were particularly acute because the 'home front' was also the combat front in so many places. Combat operations in the Territory of Hawaii (Pearl Harbor) and in the Aleutian Islands (Attu, Kiska) in the Territory of Alaska brought the war into what are now states of the United States, but it was not until 14 years after the end of World War II that Alaska (January 1959) and Hawaii (August 1959) became states. The United States was entirely free from the bombing, shelling, and other destruction of major urban centers that characterized so much of the conflict in Europe and Asia. The U.S. Merchant Marine fleet suffered loss or damage to nearly 250 ships along the Atlantic and Pacific coasts of the United States and in the Gulf of Mexico (<http://usmm.org/shipsunkdamaged.html>; accessed 25 April 2024), but the only successful mainland attack on U.S. soil was that of a 'Balloon Bomb' launched from Japan that exploded and killed a woman and five children in Lake County, Oregon (Mikesh, 1973).

Apart from the casualties, the impact of the war on the home front in the United States was characterized by restricted access to many materials and products previously taken

for granted or considered 'day-to-day' items (e.g., automobiles, bicycles, tires, sugar, coffee, red meat). Reminders of 'home front' challenges are preserved in published materials from the war years (especially magazines) but often are best reflected in advertisements, editorials, footnotes, or 'tear-sheets' that are easily overlooked by modern scholars who are not directly seeking such information (Jones, 2009). Restricted access, rationing, and price-control were already part of life in the United States before the country declared war and entered the conflict in December 1941. In addition to re-arming itself and building up its armed services, the United States was providing food and military equipment and supplies to European allies for over a year before entering the war as a combatant nation, and as early as 1939 President Franklin Roosevelt declared a limited state of emergency in the U.S. (Kennett, 1985).

In anticipation of reduction in availability of many basic materials, the Office of Price Administration was launched in August of 1941 and 'OPA' was added to the acronyms that emerged in the war years to join the 'alphabet soup' of such that were already familiar from the depression years and Franklin D. Roosevelt's 'New Deal' initiatives (Kennedy,



Fig. 3. The front cover of the ‘Type 5A’ merit badge pamphlet. This cover is made of a heavy cardstock. The inside covers lacked the colorful depictions of merit badges and instead carried only black-ink print about steps to take to earn a merit badge (inside front cover), and suggestions for speaking with a merit badge counselor (inside back cover). These ‘war cover’ pamphlets were printed for Boy Scout merit badge pamphlets from March through November 1944. This copy is dated June 1944.

1999). The OPA emplaced a rationing system for the country and by May 1942 froze prices for many widely used goods and materials (Wright, 1998). Enforcement and logistical implementation of OPA regulations was coordinated by ration boards that were established across the country (Heide and Gilman, 1995; Yellin, 2004). Price controls and rationing were not restricted to the more obvious materials for rearmament and defense, like metals (Fig. 5), but impacted most aspects of life at home (Fig. 6). In the early summer of 1942 War Ration Book One (sometimes referred to as ‘the sugar book’) was released (Fig. 7; Springate, 2023a). Sugar was the first food item to be rationed and was rationed from the spring of 1942 through June 1947 (26 pounds per year; Cohen, 1991; Yellin, 2004; Springate, 2023a). It was followed by coffee (rationed to one pound every five weeks, soon reduced to one pound every six weeks, with rationing ending in

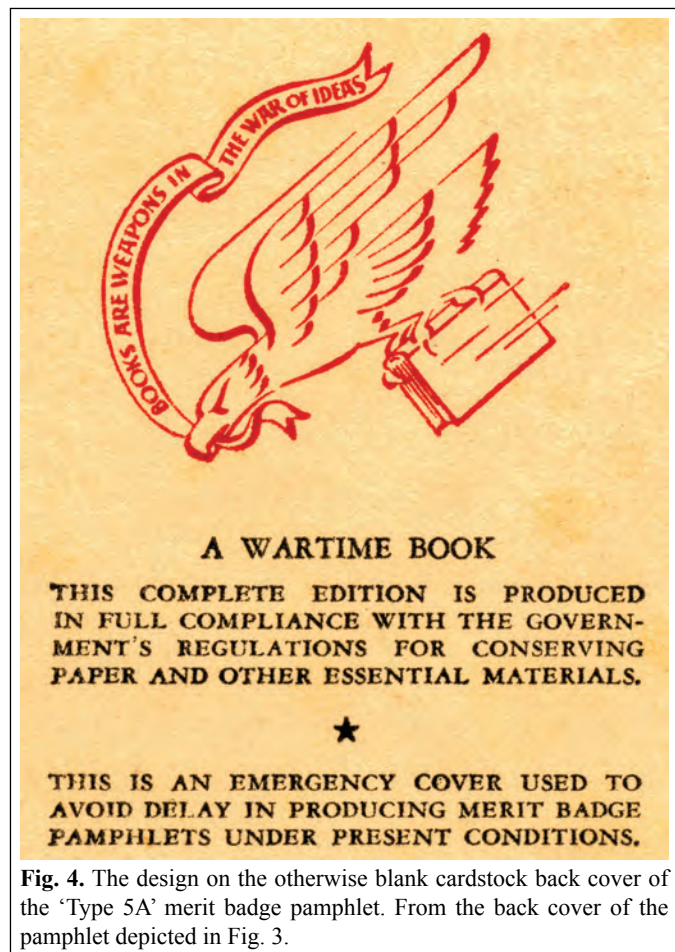


Fig. 4. The design on the otherwise blank cardstock back cover of the ‘Type 5A’ merit badge pamphlet. From the back cover of the pamphlet depicted in Fig. 3.

July 1943 [Springate, 2023a]), red meat, canned vegetables and fruits, juices, and other processed foods (canned, frozen, dried, etc.). Ration books two, three, and four were released with colored stamps — for example blue for processed foods and red for meats, cheese, and fats. In February 1944, fiber tokens, each worth one ration point, were produced to provide a means of making ‘change’ for purchases of rationed goods that were necessarily accompanied by the appropriate stamps (Fig. 8; Cohen, 1991; Antek, 2020). Those tokens also were color-coded in blue and red designs.

Butter, fresh milk, and eggs were not rationed during the war, nor were fresh fruits and vegetables, but ceiling prices for those products as well as cereals, bread, poultry, fats, and oils were established by the OPA (Springate, 2023a). Unrationed foods, including fresh fish, poultry, turtles (Lagler, 1943; Fig. 9), and other reptiles were a useful way of diversifying diet, stretching one’s ration stamps, and reducing reliance on rationed meats.

Sugar was rationed early because it was needed for chemical production of explosives (Heide and Gilman, 1995) and was also reserved for food and beverage production for armed forces. Much of the sugar went to provide Coca-Cola for service personnel (Cohen, 1991:282; Wright, 1998:58) to help meet the pledge by Robert Woodruff, President of the Coca-Cola Company, that the company would “see that every man



Fig. 5. Office of Price Administration pamphlets documenting regulations pertaining to metals. Note that the Iron and Steel pamphlet is dated June 1941, six months before the United States entered the war. From the collection at The University of Texas Library in Austin, Texas.



Fig. 6. Office of Price Administration pamphlets addressing rationing in the United States, and specific regulations for sugar, gasoline, and furniture. Price controls and rationing impacted many basic goods and materials during the war. From the collection at The University of Texas Library in Austin, Texas.

in uniform gets a bottle of Coca-Cola for five cents, wherever he is and whatever it costs the company” (Coca-Cola Company, 2012). 64 Coke bottling plants were built for the troops during the war (Cohen, 1991) to help live up to the pledge, a

laudable goal in spirit, even if not always met under the logistical realities of war — correspondent Ernie Pyle wrote of Coca-Cola that there was “nary a bottle of it in Africa” in the early months of the war (Pyle, 1943:63).

Because the vast majority of U.S. supplies of natural rubber were cut off early in the war and the country had inadequate reserves to meet anticipated needs (American Chemical Society, 1998), the first non-food commodity to be rationed was rubber, followed soon by gasoline (to help preserve rubber automobile tires). In an effort to conserve rubber, 35 mile-per-hour speed limits were established on the east coast in May 1942 and expanded to a nationwide restriction in December of that year (Heide and Gilman, 1995; Springate 2023b). The bicycle trade was stopped shortly after the attack on Pearl Harbor in December 1941. Sale of automobile tires also was stopped that month, and rationing was emplaced on 5 January 1942 (Springate, 2023b). Civilian automobile production ended in February 1942 and automobile manufacturers began to re-tool their production plants to serve the war effort (Kennett, 1985; Cohen, 1991; Heide and Gilman, 1995; Springate 2023b). In January 1943 pleasure-driving was prohibited for the duration of the war (Heide and Gilman, 1995). Automobile license plates were traditionally made of metal, but the war needs for metals were high, and at least eight states (Arizona, Arkansas, Illinois, Louisiana, Missouri, Montana, Utah, and Virginia) adopted alternative materials for license plates, including Masonite, sugarcane, and soybeans (Cohen, 1991). The 1943 Illinois plate (Fig. 10) used soybean and paper pulp, chemically treated to strengthen it for use in the winter and summer (Cohen, 1991; Sistak and Baur, 2019).

PAPER RATIONING AND SCRAP PAPER DRIVES

The War and Navy Departments (the Department of Defense as an ‘umbrella’ administrative branch was not formed until 1949) operated under an extraordinary need for paper throughout the war, and waste paper was considered an essential material (Figs. 11–12). The Japanese balloon bombs mentioned above included both anti-personnel and incendiary bombs and were intended to spark wildfires in the forests of the northwestern United States and southwestern Canada (Mikesh, 1973), a potentially serious threat for the war effort because of loss

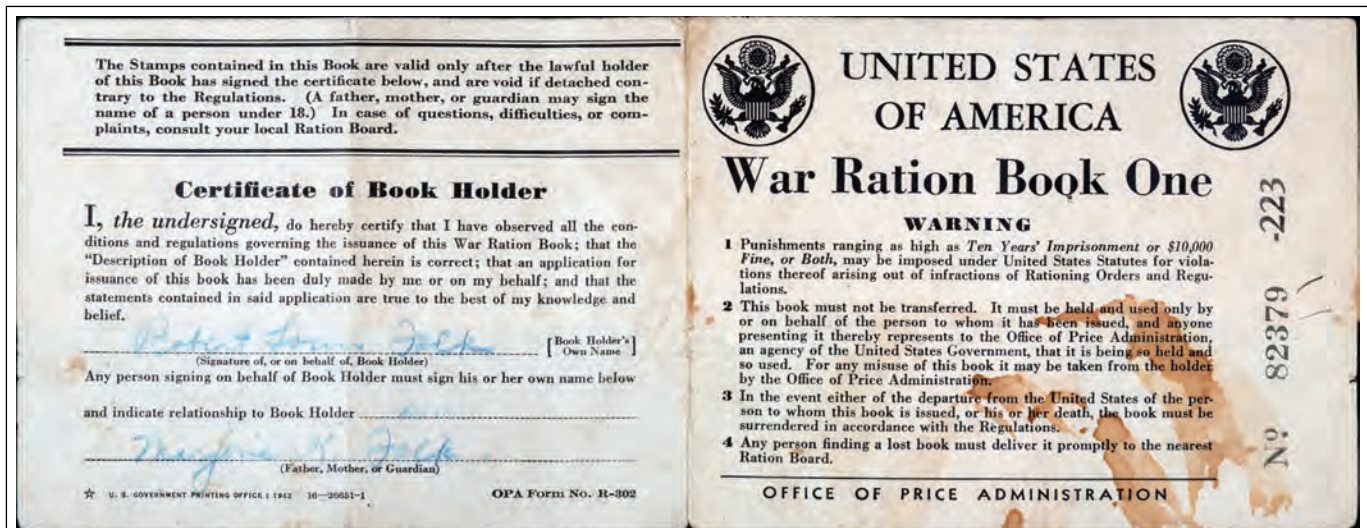


Fig. 7. War Ration Book One issued in 1942. Each person was issued a ration booklet like this that contained stamps that had to be surrendered at the time purchases of rationed goods were made. Stamps had to be torn from the booklet in the presence of the vendor; loose stamps were not acceptable. From C. Bell collection.

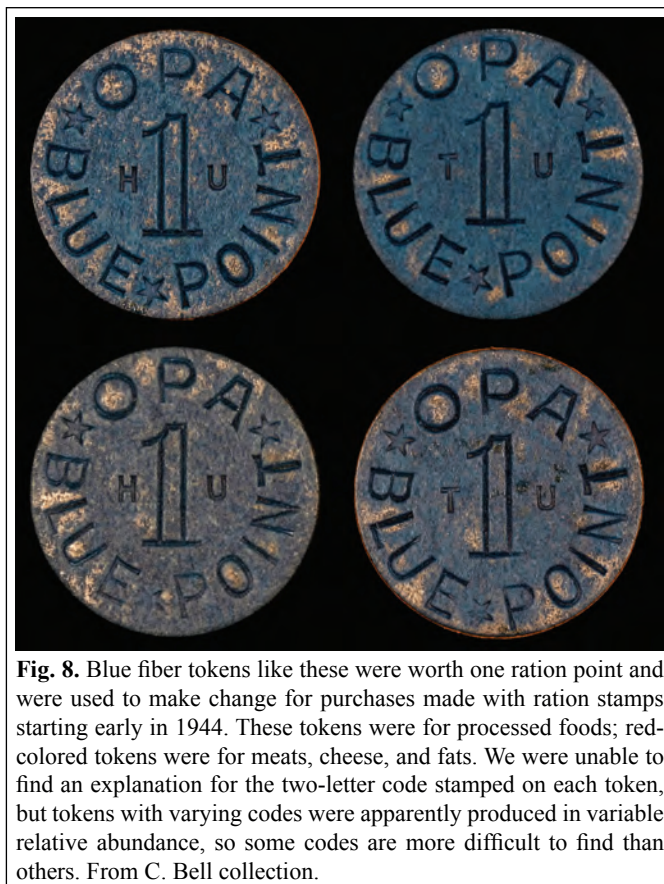


Fig. 8. Blue fiber tokens like these were worth one ration point and were used to make change for purchases made with ration stamps starting early in 1944. These tokens were for processed foods; red-colored tokens were for meats, cheese, and fats. We were unable to find an explanation for the two-letter code stamped on each token, but tokens with varying codes were apparently produced in variable relative abundance, so some codes are more difficult to find than others. From C. Bell collection.

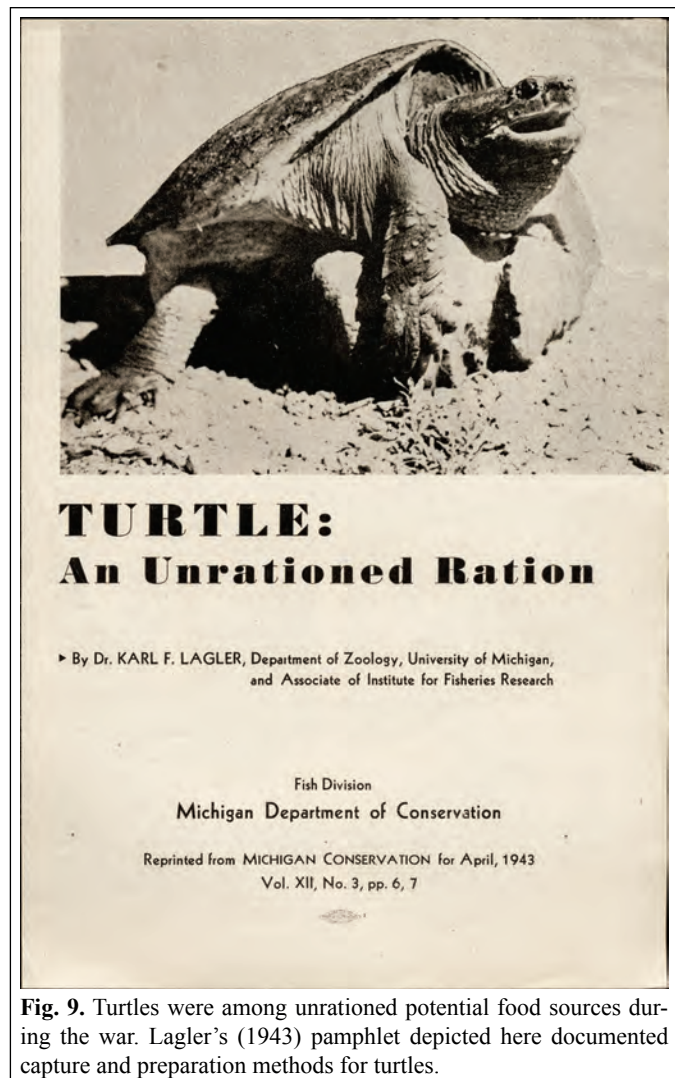


Fig. 9. Turtles were among unrationed potential food sources during the war. Lagler's (1943) pamphlet depicted here documented capture and preparation methods for turtles.



Fig. 10. A 1943 fiberboard vehicle license plate from Illinois. This plate was made of soybean and paper pulp but was sturdy enough to withstand winter conditions. Plates like these were adopted as an alternative to plates made of metal that was needed for the war effort. From C. Bell collection.



Fig. 11. A WWII propaganda poster urging citizens to save waste paper for the war effort. This poster was printed by the Office of Emergency Management Division of Information, and is undated. Its dimensions are 44 x 56 cm (17.25 x 22 inches). Posters like these were distributed across the country by the Boy Scouts of America and were replaced approximately every two weeks. The artwork of many WWII propaganda posters was produced anonymously (Pollack, 2016). Here, it is attributed to "Rabkin." That may be Leo Rabkin (1919-2015) who in the 1960s established himself as a box-artist and a member and then President of the American Abstract Artists Group (Anonymous, 1981). From C. Bell collection.

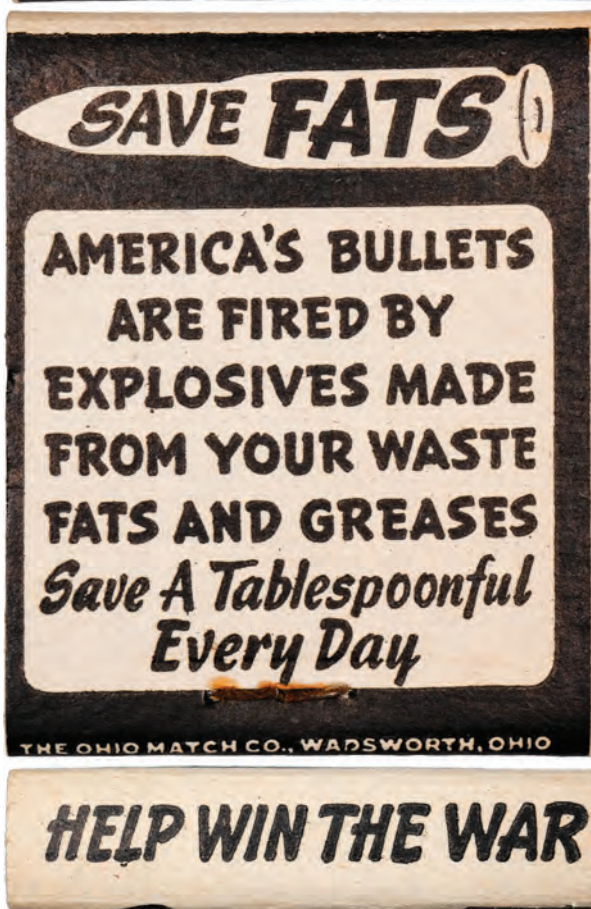


Fig. 12. A matchbook produced by the Ohio Match Company in Wadsworth, Ohio encouraging preservation of paper, fats, and grease to support the war effort. From C. Bell collection.

of wood for construction and for paper production. Armed services used paper for thousands of items (Cohen, 1991), including draft cards and other identification paperwork, printed records, protective bands for bombs, boxes for artillery shells and cartridges, and containers for food, equipment, medical supplies, and other materials.³

To help meet the need, paper was rationed during the war and serious efforts were made to gather waste paper. In 1943 publishers in the United States had access to only 37.5% of the paper they had consumed in 1939 (Manning, 2014). Nonetheless, the government recognized that the need for reading materials for service personnel was real, and books were considered essential equipment. 900 tons of paper per quarter-year were allocated to publishers for production of books for the Armed Services Editions (Manning, 2014). The larger size, thick hard covers, and cotton-cloth outer covering of hardback books made them impractical for mass production for armed services, so, of necessity, Armed Services book editions were produced as paperbacks and were sized to fit conveniently in standard uniform pockets. 1,322 titles appeared in the Armed Services Editions series between September 1943 and June 1947 (Manning, 2014).⁴ Several of those were titles written by naturalists or addressed natural history subjects, including herpetology (Fig. 13–14).

Collection drives for used paper were conducted throughout the war but were occasionally suspended when, for example, supply of collected paper exceeded the market demand in 1942. By the end of 1943 all excess materials had been used, and a renewed effort to gather waste paper was under way. Another shortage emerged early in 1945 and General Dwight Eisenhower sponsored a nationwide paper collection effort. A special medal for war service, the ‘Boy Scout General Eisenhower Waste Paper Campaign’ medal was awarded by the War Production Board to 299,936 Boy Scouts who each gathered at least 1,000 pounds of waste paper during the campaign (March–April 1945; Fig. 15); in total the drive yielded over 720,000 tons of paper (Cohen, 1991).

The BSA were involved in the war effort on the home front as soon as the country was drawn into the war. The need for residents in the United States to conduct and respond to air-raid warnings was brought into sharp focus after the attack

³ Interestingly, cigarettes escaped rationing in the United States during the war. Domestic consumption was 236,000,000,000 cigarettes in 1942 alone, and priority rights were given for machine repair at a paper company that was manufacturing cigarette paper. Cigarettes were included in K-rations during the war and joined food and mail as the big three necessities needed to maintain morale in the Army. A 1943 book-length essay on the ill-health effects of cigarettes and the perceived complications of providing free cigarettes to armed forces is a fascinating (though dense and somewhat difficult) read and is the source of these data (Gehman, 1943).

⁴ Mass production of paperback volumes during the war launched a major change in the publishing industry, and in book consumption, in the United States. Molly Manning (2014:61) noted “In 1939 fewer than two hundred thousand paperback books were sold in the United States; by 1943, this number had climbed to over forty million.”

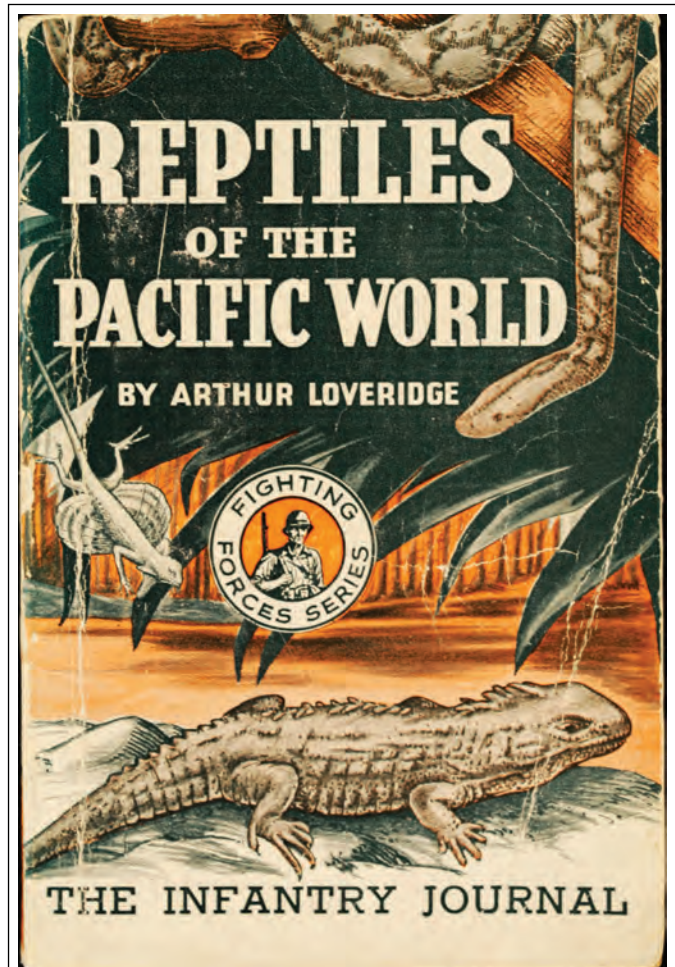


Fig. 13. A herpetological example of a wartime paperback book produced for armed forces of the United States, The Infantry Journal Fighting Forces Series edition of Arthur Loveridge’s *Reptiles of the Pacific World* (1945). Book dimensions are 16.3 x 11 cm (6.4 x 4.3 inches), sized to fit in the pocket of a standard uniform.

at Pearl Harbor on 7 December 1941. On 8 December 1941 Walter W. Head (BSA President) and James West (BSA Chief Executive) offered to President Roosevelt the full cooperation of the BSA with the war effort (Ellis, 2005). A special training poster outlining what to do in an air-raid was being prepared before the attack; expedited completion of the poster became a high priority. The Boy Scouts, with 1,600,000 members in 1942, then assumed the responsibility of distributing the training poster all across the country (Kennett, 1985; Ellis, 2005). The Office of Civilian Defense (formed in May 1941) then designated the BSA as official Civil Defense messengers; in 1943 their role expanded to government dispatch bearers for the Office of War Information (formed by Roosevelt by combining four federal agencies into one in June 1942 in an effort to standardize government releases of information; Winkler, 1979). In that capacity they joined with other organizations and became one of the main distributors of propaganda posters (like the one depicted in Fig. 11; Darman, 2011). Posters were exchanged for new ones approxi-

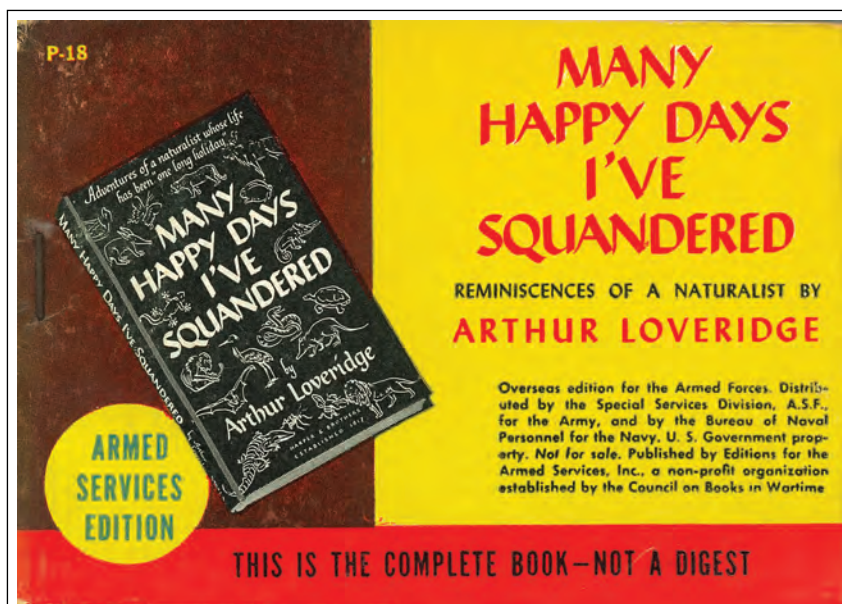


Fig. 14. The Armed Services Edition of Arthur Loveridge's *Many Happy Days I've Squandered* (1944). Book dimensions are 10 x 14 cm (3.9 x 5.5 inches). Small-sized paperback books like these balanced the need for paper conservation during the war with the need to provide reading materials for armed service personnel.

mately every two weeks (Kennett, 1985; Ellis, 2005). In this way, despite the fact that the BSA was a major consumer of paper during the war because they produced many publications to support their operations and training of scouts, the organization also helped spread the word about rationing programs and their justification, including the need to preserve waste paper for the war effort.

ACKNOWLEDGEMENTS

We thank Ruth M. Robinson and Robert L. Folk for sharing their reflections about rationing, wartime restrictions, and life on the home front in the United States during World War II. We gratefully acknowledge John Moriarty for introducing us, through his writing, to the publications of the BSA, and for helping us clarify the different numbering systems for 'Type' covers of merit badge pamphlets. We drew heavily upon the Government Documents housed in The University of Texas



Fig. 15. The Eisenhower Waste Paper Campaign medal, issued in 1945 to Boy Scouts who gathered 1,000 pounds or more of waste paper. The paper-drive campaign ran for two months in early 1945. Left: Obverse of the medal reads "War Service 1945. Boy Scout Gen. Eisenhower Waste Paper Campaign." Right: Reverse of the medal reads "Awarded for extraordinary patriotic achievement in the Boy Scout Gen. Eisenhower Waste Paper Campaign March – April 1945." From C. Bell collection.

Perry Castañeda Library for background information and context to rationing in the U.S. during the war; we share some of that in our Figures 5 and 6 but note that only our ability to peruse open stacks made this possible — had the material been in storage we never would have found it. Breck Bartholomew helped us track down copies of the *Kahuna's Katalog* volumes and we also thank him for inspiring us to write about the intersections between World War II and natural history. Travis LaDuc shared hours of stimulating conversations on this and related topics over the last decade and provided helpful comments on an earlier draft of this paper. The manuscript also was improved by comments from Breck Bartholomew, Matthew Brown, John Moriarty, John Moretti, Mitchell Riegler, and Geraldine Swartz. All errors remain exclusively our own.

REFERENCES

- American Chemical Society. 1998. United States Synthetic Rubber Program, 1939-1945. American Chemical Society, Akron, Ohio. [1] + 6 pp.
- Anonymous. 1981. Leo Rabkin Works. La Jolla Museum of Contemporary Art, October 3 – November 15, 1981. La Jolla Museum of Contemporary Art, La Jolla, California. 73 + [1] pp.
- Antek. 2020. A guide to WW2 OPA tokens: An obscure section of numismatics [accessed 10 December 2023].
- Coca-Cola Company. 2012. The chronicle of Coca-Cola: A symbol of friendship [accessed 10 December 2023].
- Cohen, Stan. 1991. V for Victory. America's Home Front During World War II. Pictorial Histories Publishing Company, Inc., Missoula, Montana. viii + 408 pp.
- Conant, Roger. 1944. Reptile Study. Merit Badge Series. Boy Scouts of America, New York, New York. 63 pp. [Catalog 3813:4500644].
- Darman, Peter. 2011. Posters of World War II. Chartwell Books, Inc., New York, New York. 224 pp.
- Ellis, Robert. 2005. Getting the message out. The Poster Boys of World War II. Prologue Magazine [Quarterly of the National Archives and Research Administration] 37(2) [accessed 24 April 2024].
- Gehman, Jesse Mercer. 1943. Smoke Over America. The Roycrofters, East Aurora, New York. Beoma Publishing House, Patterson, New Jersey. 572 + [1] pp.
- Heide, Robert, and John Gilman. 1995. Home Front America. Popular Culture of the World War II Era. Chronicle Books, San Francisco, California. 144 pp.
- Jones, John Bush. 2009. All-Out for Victory! Magazine Advertising and the World War II Home Front. Brandeis University Press, Waltham, Massachusetts [Published by University Press of New England, Lebanon, New Hampshire]. xi + [3] + 314 pp.
- Kennedy, David M. 1999. Freedom from Fear. The American People in Depression and War, 1929-1945. Oxford University Press, New York, New York. xv + [1] + 936 pp., 65 photographs.
- Kennett, Lee. 1985. For the Duration. The United States Goes to War, Pearl Harbor – 1942. Charles Scribner's Sons, New York, New York. ix + [1] + 243 pp., 26 photographs.
- Lagler, Karl F. 1943. Turtle: An unrationed ration. Michigan Conservation 12(3):6–7.
- Loveridge, Arthur. 1944. Many Happy Days I've Squandered. Reminiscences of a Naturalist. Editions for the Armed Services, Inc., Published by arrangement with Harper & Brothers, New York, New York. 351 pp. [Armed Services Edition P-18].
- Loveridge, Arthur. 1945. Reptiles of the Pacific World. The Infantry Journal, Fighting Forces Series, Washington, D.C. xii + 236 + [7] pp.
- Manning, Molly Guptill. 2014. When Books Went to War. The Stories that Helped Us Win World War II. Houghton Mifflin Harcourt, Boston, Massachusetts, and New York, New York. xv + [3] + 267 pp.
- Mikesh, Robert C. 1973. Japan's World War II Balloon Bomb Attacks on North America. Smithsonian Institution Press, Washington, D.C. vi + 85 pp.
- Moriarty, John. 2012. History and evolution of the Boy Scouts of America Reptile Study merit badge pamphlet. *Bibliotheca Herpetologica* 10:21–27.
- Pollack, David. 2016. World War II Posters. Schiffer Publishing, Ltd., Atglen, Pennsylvania. 352 pp.
- Price, Joe. [1998]. *Kahuna's Katalog of Boy Scout & Cub Scout Handbooks. Collector's Guide Volume 1.* Reprinted. Privately Published. 465 pp. [No date of publication was provided in the book; we use 1998 based on the dated foreword by Joe Price on p. 1].
- Price, Joe. 2002. *Kahuna's Katalog of Boy Scout Merit Badge Books. Collector's Guide Volume 2.* Privately Published. 350 pp.
- Price, Joe. No date. *Kahuna's Katalog of Boy Scout Literature. Collector's Guide Volume 3.* Privately Published. 676 pp.
- Pyle, Ernie. 1943. Here is Your War. The World Publishing Company, Cleveland, Ohio, and New York, New York. [6] + 246 pp.
- Sistak, Barb, and Tom Baur. 2019. 1943 note from Sec of State about non-metal plates. License Plate Garage [accessed December 2023].
- Springate, Megan E. 2023a. Food rationing on the World War II home front [accessed 20 December 2023].
- Springate, Megan E. 2023b. Rationing of non-food items on the World War II home front [accessed 20 December 2023].
- Winkler, Allan M. 1979. The Politics of Propaganda. The Office of War Information 1942-1945. Second Printing. Yale University Press, New Haven, Connecticut. x + 230 pp.
- Wright, Mike. 1998. What They Didn't Teach You about World War II. Presidio Press, Novato, California. xix + [1] + 345 pp.
- Yellin, Emily. 2004. Our Mothers' War. American Women at Home and at the Front During World War II. Free Press, New York, New York. xiv + 447 + [2] pp.

We suggest the following format for citing this article:

Bell, C. J. and S. Skwarcan 2024. The Boy Scouts of America *Reptile Study* Merit Badge Pamphlet in World War II and the Broader Role of the Boy Scouts in Paper Rationing and Propaganda Distribution During the War. *Bibliotheca Herpetologica* 18(10):98–107.

Introducing *Wahlgreniana*

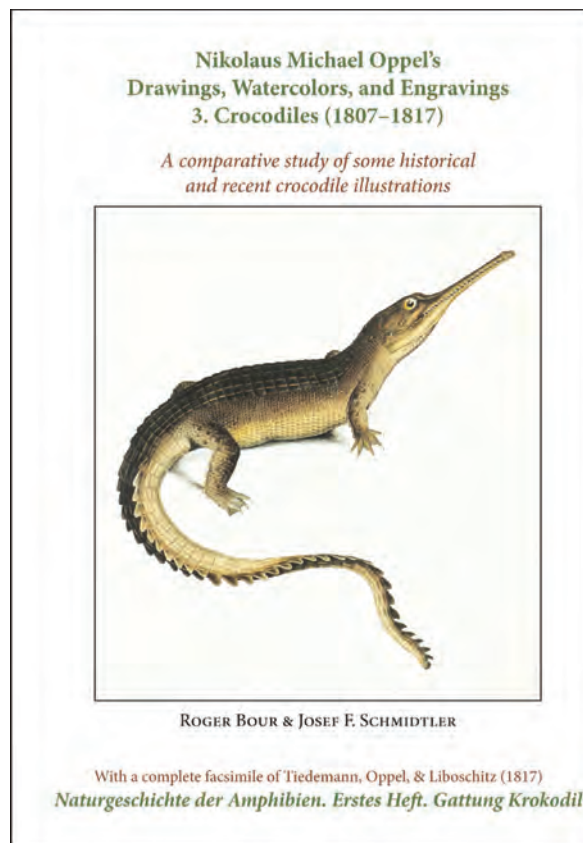
A new book series published by the *International Society for the History and Bibliography of Herpetology* (ISHBH) named in honor of Richard Wahlgren (1946–2019), a founding member and first Chairman of the society.

The inaugural volume, written by Roger Bour and Josef Schmidtler, examines the crocodilian illustrations of Nikolaus Michael Oppel, drawn between 1807 and 1817; primarily eleven previously unpublished watercolors. These illustrations played an important role in early crocodilian taxonomy. The authors give a history of each illustration, referencing museum specimens they are based upon and comparing them to other contemporary and modern crocodilian illustrations.

In 1817 Oppel, along with Tiedemann and Liboschitz, published, *Naturgeschichte der Amphibien. Erstes Heft. Gattung Krokodil*. Originally planned as the first volume of a much larger work, this volume, along with an Atlas of plates, published separately by the authors, remains the only volume published. Limited to 150 printed copies, this book has fallen into obscurity and is largely overlooked, despite its importance. Although the text and the atlas are both available online, they are missing from the main online databases and libraries of older natural history books. Neither has ever been reprinted.

This volume reprints both the text and the atlas of Tiedemann, Liboschitz, and Oppel (1817), following the authors' thesis on Oppel's illustrations, which make up the bulk of the Atlas.

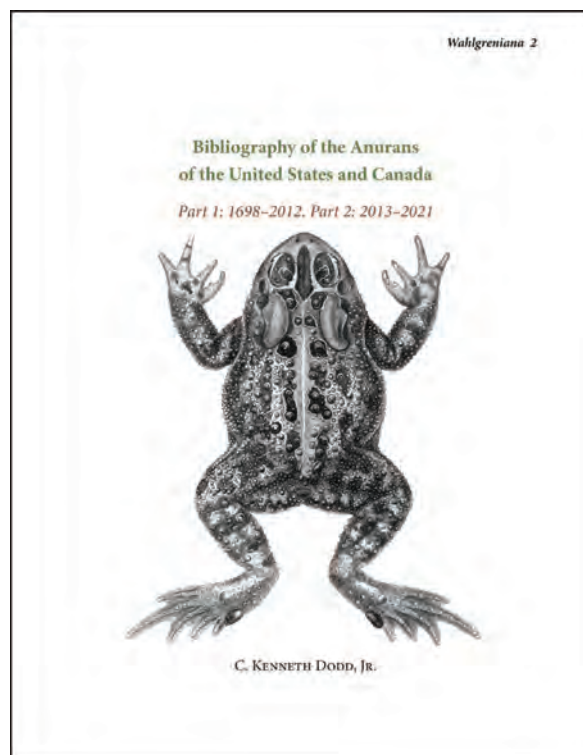
Specifications: Hardcover (ISBN: 9780578293998), x + 184 pages, full color. **Price:** \$65.00 retail; **\$39.00 for ISHBH members** (plus \$7.00 postage and handling). **Ordering:** Copies may be ordered at www.ISHBH.com, or from most Online and physical bookstores world-wide.



Wahlgreniana Volume 2

The *Bibliography of the Anurans of the United States and Canada Part 1: 1698–2012. Part 2: 2013–2021* was compiled largely as background material for Dodd's *The Frogs of the United States and Canada* (First edition published 2013 by Johns Hopkins University Press; 2nd edition forthcoming from the same publisher), with the objective of developing a comprehensive reference to publications on the natural history of North American anurans. It focuses on life history, ecology, systematics, behavior, physiological ecology, diseases, parasites, and conservation biology, and includes important references on distribution and other topics useful to understanding frogs in their natural environment. Strictly physiological, developmental, and genetics citations have been excluded, as are routine new distribution records, especially when life history information was not included. Master's theses and doctoral dissertations were included opportunistically as they were encountered. The two parts correspond to the cut-off dates for the two editions of *The Frogs of the United States and Canada*.

This extraordinary compilation of the Anuran literature extends back to Gabriel Thomas' (1698) mention of the bullfrog—the earliest reference to a specific species the author encountered—through 2021. Anyone working on the anurans of the United States and Canada will



undoubtedly find numerous references to publications they didn't know existed. This is exactly what bibliographies are meant for and this bibliography succeeds commendably.

Available in two formats: A hardcover book and an eBook. The eBook allows for searches of the entire bibliography. To minimize problems utilizing the eBook, it is being distributed solely by existing eBook sellers (not by ISHBH).

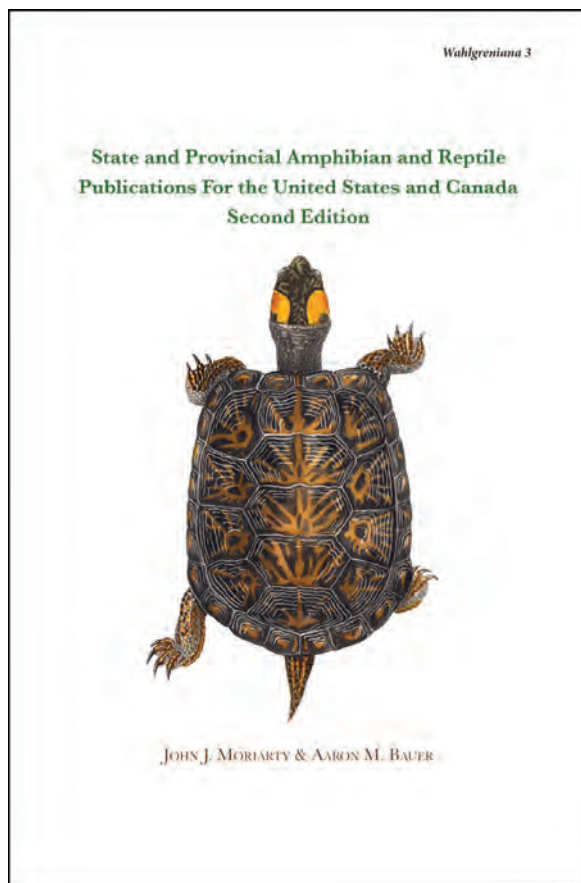
Specifications: Hardcover (ISBN: 979-8-218-06245-3), x + 282 pages. **Price:** \$35.00 retail; **\$21.00 for ISHBH members** (plus \$7.00 postage and handling). **Ordering:** Copies may be ordered at www.ISHBH.com, or from most Online and physical bookstores world-wide.

eBook also available (ISBN: 979-8-218-06246-0). **Retail price \$9.99.** The eBook version may be ordered from most eBook distributors Online.

***Wahlgreniana* Volume 3**

State and Provincial Amphibian and Reptile Publications for the United States and Canada, Second Edition by John J. Moriarty and Aaron M. Bauer. This bibliography is intended as a guide to the regional (state and provincial) herpetofaunal literature of the United States and Canada through December 31, 2023. The oldest references cited date back to the late 18th century. It includes over 1300 references dealing primarily with single states or provinces or substantial portions thereof. Regional works of broader scope, covering up to three states or provinces (more in the cases of New England and the Maritime provinces of Canada) have also been incorporated. In addition to journal articles, citations are provided for field guides, published state and provincial bibliographies, and substantial checklists. Many of the works referenced do not appear in existing print or online databases. All citations are bibliographically complete and brief comments regarding different reprints, revisions and editions are provided. The bibliography will be a valuable research tool for those working on regional or local surveys, conservation assessments or field biology of North American amphibians and reptiles. It can also serve as a guide for bibliophiles who are building their own libraries of state and provincial works. The bibliography is illustrated with more than 100 cover images from among the cited works.

Specifications: Paperback (ISBN: 979-8-218-44771-7), vi + 85 pages. **Price:** \$20.00 retail; **\$12.00 for ISHBH members** (plus \$7.00 postage and handling). **Ordering:** Copies may be ordered at **www.ISHBH.com**, or from most Online and physical bookstores world-wide.





International Society for the History and Bibliography of Herpetology

Bibliotheca Herpetologica Vol. 18

Formerly the *International Society for the History and Bibliography
of Herpetology Newsletter and Bulletin*

Contents

| | |
|-------------------------|----|
| From the Chairman | i |
| From the Editor | i |
| About the Cover | ii |

Articles

| | |
|---|----|
| Bettelheim, M. P. 2024. <i>Het Schildpadboek</i> : The Origins and Inspiration Behind the Turtle Watercolors of Adriaen Coenen's <i>Visboek</i> and <i>Walvisboek</i> | 1 |
| Krecsák, L. 2024. Hans Strøm's Norwegian Asp Viper (<i>Coluber aspis</i>): a misdiagnosed 18th century <i>Vipera berus</i> | 30 |
| Rösler, H., P. Daszkiewicz, I. Ineich & W. Böhme 2024. <i>Lacertulus minimus variegatus</i> Plumier – a pre-Linnean description of a remarkable gecko (Gekkota: Sphaerodactylidae: <i>Sphaerodactylus</i>) from Haiti (Greater Antilles). | 36 |
| Bell, C. J. and T. J. LaDuc. 2024. Hermon Carey Bumpus and the <i>Reptiles and Batrachians of Rhode Island</i> , with Comments on Other Herpetological Content in <i>Random Notes on Natural History</i> , 1884–1886. | 44 |
| Bauer, A. M., R. Powell and A. H. Griffing. 2024. Two Largely Forgotten Early Sources on the Fer-de-Lance of Martinique, <i>Bothrops lanceolatus</i> | 60 |
| Dodd, C. K. Jr. 2024. <i>The Hermit Naturalist</i> , A Nearly Forgotten Snake Story. | 71 |
| Dodd, C. K. Jr. 2024. Women in Herpetology – A Short Biography of Mary Hewes Hinckley. | 74 |
| Mendyk, R. W. 2024. Early Zoo Studies in Herpetology: Catherine C. Hopley and the London Zoological Gardens. | 81 |
| Rouot, S. 2024. Jagannathan “Viji” Vijaya and the Forest Cane Turtle (<i>Vijayachelys silvatica</i> , Henderson 1912). | 88 |
| Bell, C. J. and S. Skwarcan 2024. The Boy Scouts of America <i>Reptile Study</i> Merit Badge Pamphlet in World War II and the Broader Role of the Boy Scouts in Paper Rationing and Propaganda Distribution During the War. | 98 |